SMEA, "Rare Plant and Animal Survey; Santa Clarita Water District Service Area" (1995; 1995B)

San Marino Environmental Associates

Rare Plant and Animal Survey
Santa Clarita Water District Service Area
Los Angeles County, California

Prepared for: Santa Clarita Water Company
P.O. Box 903
Santa Clarita, CA 91380

Prepared by: San Marino Environmental Associates
Project leaders: Thomas R. Haglund, Ph.D.
Jonathan N. Baskin, Ph.D.

August 1995

560 South Greenwood Avenue San Marino, California 91108-1270 (818) 792 - 2382

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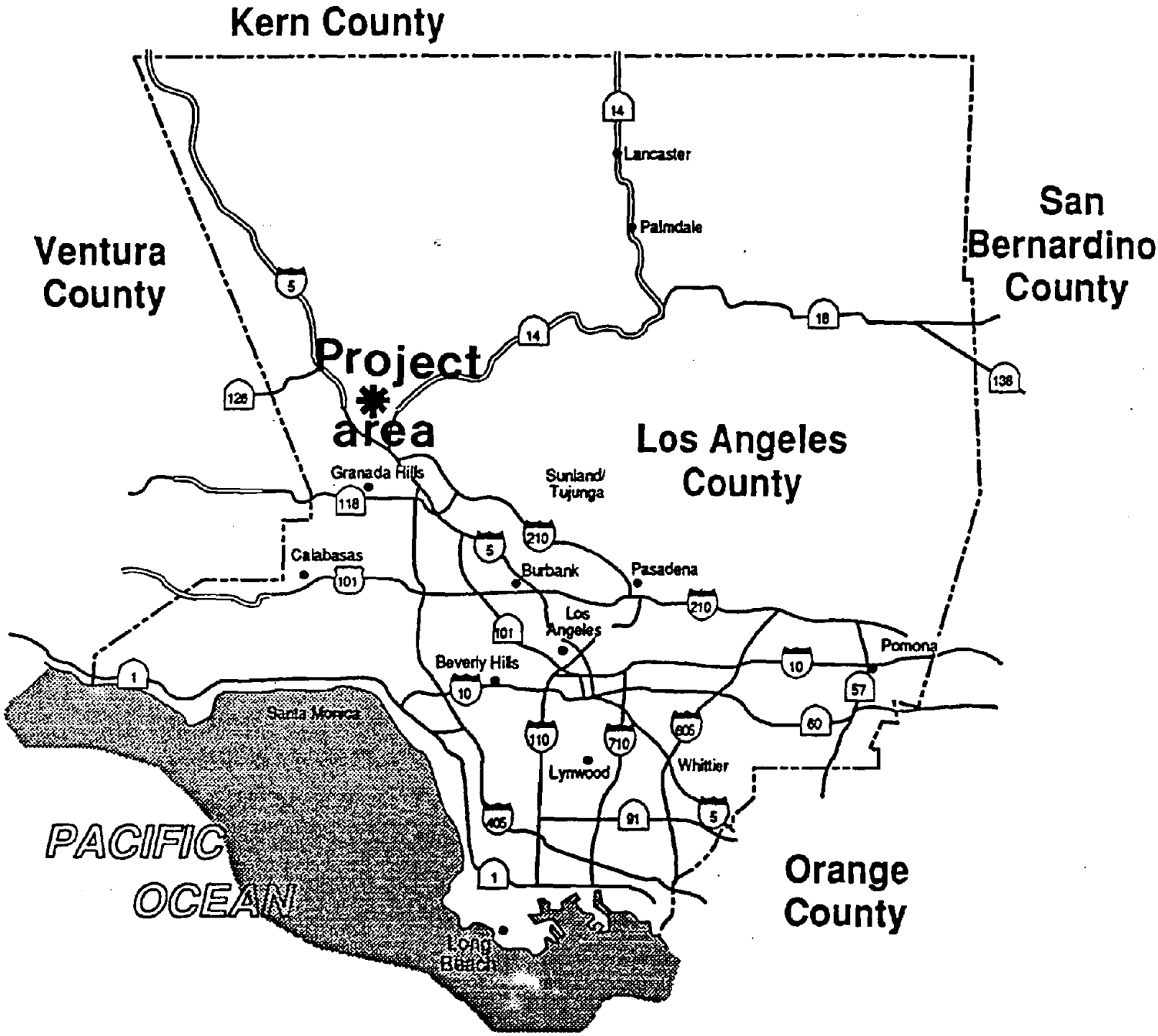
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Introduction

This report presents the results of a rare plant and animal survey conducted by San Marino Environmental Associates for the Santa Clarita Water Company. The primary objective of the survey was to document the presence of rare plants and animals within the study site.

The study site was the Santa Clarita Water Company service area in northern Los Angeles County, see map on preceeding page. The site is an ecologically diverse unit which encompasses approximately 80 square miles including the City of Santa Clarita (for detail of the study area see fold out Map 1, supplied by Stetson Engineers, in the rear pocket). Included within this area is a portion of Los Angeles County Sensitive Ecological Area (SEA) 23, which includes the Santa Clara River.

San Marino Environmental Associates began field work in May 1993 and concluded the field work in September 1994. Survey methodological details have been supplied in a separate section. This report contains lists of anticipated species and indicates which species were actually found during the surveys. Particular attention was paid to sensitive species during the surveys and all sensitive species that might have been expected to occur in the study area are separately discussed in this report.

Study Team

The following is a list of the primary personnel who were used during the rare plant and animal survey. Although individuals had primary field responsibilities, all personnel made observations of all sensitive species they encountered. For each survey category the individuals with oversight or supervision responsibility are indicated by an * following their names. Curricula vitae of personnel whose name is followed by an * can be found in Appendix 1.

Project Supervision	Jonathan N. Baskin, Ph.D.* Thomas R. Haglund, Ph.D.*
Plant Surveys	Curtis Clark, Ph.D.* Vince Coleman, M.S.
Beefly/Butterfly Surveys	Rudolf Mattoni, Ph.D.* Richard Rogers Thomas R. Haglund, Ph.D.*
Fish Surveys	Thomas R. Haglund, Ph.D.* Jonathan N. Baskin, Ph.D.* Fritz Hertel, Ph.D. Antonio Bentivoglio, M.S.
Amphibian Surveys	Glenn Stewart, Ph.D.* Michael Fuller Thomas R. Haglund, Ph.D.*
Reptile Surveys	Glenn Stewart, Ph.D.* Michael Fuller Thomas R. Haglund, Ph.D.*
Bird Surveys	Kimball Garrett, C.Phil.* Thomas R. Haglund, Ph.D.* Fritz Hertel, Ph.D.
Mammal Surveys	Glenn Stewart, Ph.D.* Michael Fuller Thomas R. Haglund, Ph.D.*

Methodology

San Marino Environmental Associates conducted the surveys for rare plants and animals species using standard survey techniques. All surveys were conducted between 22 May 1993 and 15 September 1994.

Because of the size and ecological diversity of the study area, 80 square miles, no attempt was made to document all plant species that occur there. Instead particular communities were identified and examined for the rare species that those communities might contain. Surveys for the rare species were conducted during flowering times or when the phenological development of the plants is appropriate to insure their location and proper identification.

Fifteen visits were made to the study area to assess butterfly populations within the study area. Maximum species richness occurs in two peaks, one in spring (March - early April) and a second from mid May - mid June. Fourteen regular stations were examined and trapped, in addition to visual surveys to obtain the beefly and butterfly data.

The fish survey was conducted in November of 1993. In order to determine fish distributions in the Santa Clara River SMEA personnel seined all surface water from Interstate 5 upstream to the eastern boundary of the study area. The portions of San Francisquito Creek and Bouquet Canyon Creek that had surface water were seined; as were any other surface waters.

Both diurnal and nocturnal surveys were conducted for both larval and adult amphibians. Nocturnal surveys were primarily conducted for adult reproductive anurans. Calling adults are easily located and adults moving to reproductive sites can be found along roads. The diurnal surveys included larval surveys as well as searches of appropriate habitats for adults.

Reptiles were surveyed by examining appropriate habitats and searching hiding/foraging habitats. Both diurnal and nocturnal surveys were conducted in order to locate both diurnally and nocturnally active species.

Bird surveys were conducted by walking habitats with a pair of binoculars. Surveys were conducted by individuals that are familiar with bird calls/songs as well as visual identification to facilitate recognition of as many species as possible.

Mammal surveys also included both diurnal and nocturnal surveys. In addition to visual surveys, SMEA personnel ran nocturnal traplines for rodents. On trapping nights, two traplines consisting of 50 Sherman traps each were set and checked.

Plant Communities of the Study Area

During the plant surveys SMEA personnel located and mapped the distribution of the following plant communities:

Developed/Agriculture
Alluvial Scrub
Big Sagebrush Scrub
Non-native Grassland
Vernal Pool
Mixed Chaparral
Southern Willow Scrub
Juniper Woodland
Coast live Oak Woodland
Valley Oak Woodland

Of the ten communities listed above, three of them are considered to be sensitive; vernal pool, southern willow scrub (a form of southern riparian scrub) and valley oak woodland. Of these, only the vernal pool habitat was unexpected. No vernal pools have been previously described from northern Los Angeles County (Zedler 1987) and this is undoubtedly the most sensitive community within the study area. Vernal pools were located only on Cruzon Mesa near the northern edge of the study site.

A map of the vegetation communities of the study area can be found in the rear pocket. This vegetation map can be used as an overlay on the enclosed topographic map of the study area, which can also be found in the rear pocket.

In addition to the SMEA surveys, the California Department of Fish and Game has designated seven Significant Natural Areas (Hoshovsky 1990) within or adjacent to the study area. These seven sites were designated at least partially due to the presence of sensitive plant communities. These SNAs are listed in the table below.

SNA#	LOCALITY	PLANT COMMUNITY	USGS QUAD(S)	SITE[1]
LAX - 019	Quigley Canyon	Southern coast live oak riparian forest	Newhall	W
LAX - 051	Sleepy Valley Canyons	Southern coast live oak riparian forest	Sleepy Valley Green Valley	A
		Southern sycamore alder riparian forest		
		Southern riparian scrub		
LAX - 052	Upper San Francisquito Canyon	Southern coast live oak riparian forest	Green Valley Warm Springs	A
		Southern sycamore alder riparian forest		
		Southern riparian scrub		
		Southern cottonwood willow riparian forest		

LAX - 053	Bouquet Canyon	Southern coast live oak riparian forest	Green Valley	A
		Southern cottonwood willow riparian forest		
LAX - 075	Charlie Canyon	Riversidean alluvial fan sage scrub	Newhall Devil's Head Peak	A
LAX - 082	Soledad Canyon	Southern sycamore alder riparian forest	Acton Aqua Dulce Devil's Head Peak	A
		Southern riparian scrub		
		Southern cottonwood willow riparian forest		
LAX - 085	Haskell Canyon	Southern coast live oak riparian forest	Mint Canyon Newhall	W
		Southern sycamore alder riparian forest		
		Southern riparian scrub		

[1] A = adjacent to study site; W = within the study site.

Rare Plants of the Study Area

The following table lists all the sensitive species of plants that may occur within the study area and indicates which of these species were located during surveys by SMEA personnel. The taxonomy and use of common names primarily follows The Jepson Manual (Hickman 1993).

Species	Scientific Name	Sighted[1]	Status[2]
SUNFLOWER FAMILY - ASTERACEAE			
Nevin's Brickellbush[3]	*Brickellia nevinii*	●	
Santa Susana Tarweed	*Hemizonia minthornii*		C2
Lyon's Pentachaeta	*Pentachaeta lyonii*		C2,CE
BARBERRY FAMILY - BERBERIDACEAE			
Nevin' Barberry	*Berberis nevinii*		C1,CE
CACTUS FAMILY - CACTACEAE			
Short-joint Beavertail Cactus	*Opuntia basilaris* var. *brachyclada*	●	C2
MORNING-GLORY FAMILY - CONVOLVULACEAE			
Peirson's Morning-glory	*Calystegia peirsonii*	●	C2
MALLOW FAMILY - MALVACEAE			
Davison's Bush Mallow	*Malacothamnus davidsonii*		1B
PHLOX FAMILY - POLEMONIACEAE			
Navarretia[3]	*Navarretia fossalis*	●	
BUCKWHEAT FAMILY - POLYGONACEAE			
San Fernando Valley Spineflower	*Chorizanthe parryi* var. *fernandina*		C1
Slender-horned Spineflower	*Dodecahema leptoceras*		FE,CE
GRASS FAMILY - POACEAE			
California Orcutt Grass[3]	*Orcuttia californica*	●	C2,CE

[1] **Sighted column**

- ● Species sighted during surveys by SMEA personnel during the study period.

[2] **Status column**

FE Listed as endangered by the federal government (U.S. Fish and Wildlife Service).
FT Listed as threatened by the federal government (U.S. Fish and Wildlife Service).
FP A petition has been submitted to the U.S. Fish and Wildlife Service proposing this species for endangered status.
C2 Category 2 candidate species for federal listing (taxa for which existing information indicates the taxon may warrant listing but for which substantial biological information to support a proposed rule is lacking).
CE Listed as endangered by the State of California
CP Fully Protected in California - a designation given prior to the enactment of the State of California Endangered Species Act.
SC California Department of Fish and Game Species of Special Concern.
1B California Native Plant Society - rating indicates that the plant is rare or endangered in California.

[3] These species were not expected to be found during the SMEA surveys. Nevin's brickellbush is an uncommon element of desert scrub. The study area is north of its normal range. The navarretia is a rare plant associated with vernal pools and wet ditches and California orcutt grass is an obligate vernal pool species. No vernal pools were known from northern Los Angeles County.

Plants of the Study Area

This list includes most of the common plants of the study area (excluding exotics planted around residences). The following plant list is not intended to include all the species that occur within the study area; the size of the study area precludes such an all inclusive list. The taxonomy and use of common names primarily follows The Jepson Manual (Hickman 1993).

SCIENTIFIC NAME	COMMON NAME
PTERIDOPHYTES	
MOSQUITO FERN FAMILY - AZOLLACEAE	
Azolla filiculoides	Duckweed fern
BRAKE FAMILY - PTERIDACEAE	
Pellaea andromedifolia	Coffee fern
SPIKE-MOSS FAMILY - SELAGINELLACEAE	
Selaginella bigelovii	Bigelow's spike-moss
Selaginella eremophila	Desert spike-moss
GYMNOSPERMS	
CYPRESS FAMILY - CUPRESSACEAE	
Juniperus californica	California juniper
EPHEDRA FAMILY -EPHEDRACEAE	
Ephedra californica	Desert tea
DICOTYLEDONES	
AMARANTH FAMILY - AMARANTHACEAE	
Amaranthus albus	Tumbleweed
Amaranthus blitoides	Pigweed
Amaranthus hybridus	Pigweed
SUMAC or CASHEW FAMILY - ANACARDIACEAE	
Rhus trilobata var. *pilosissima*	Squawbush
Schinus molle	Peruvian pepper tree
Toxicodendron diversilobum	Poison oak

CARROT FAMILY - APIACEAE	
Apium graveolens	Celery
Berula erecta	Water parsnip
Coriandrum sativum	Coriander
Lomatium lucidum	Shiny lomatium
Lomatium utriculatum	Common lomatium
MILKWEED FAMILY - ASCLEPIADACEAE	
Asclepias californica	California milkweed
Asclepias fascicularis	Narrow-leaved milkweed
SUNFLOWER FAMILY - ASTERACEAE	
Ambrosia acanthicarpa	Sand bur
Ambrosia psilostachya var. *californica*	Western ragweed
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Artemisia dracunculus	Tarragon
Artemisia tridentata ssp. *parishii*	Great basin sagebrush
Baccharis pilularis var. *consanguinea*	Coyote bush
Baccharis salicifolia	Mule fat
Brickellia californica	California brickelbush
Centaurea melitensis	Tocalote
Chaenactis glabriuscula var. *glabriuscula*	Yellow pincushion
Chamomilla suaveolens	Pineapple weed
Chrysothamnus nauseosus	Rubber rabbitbrush
Cichorum intybus	Chicory
Cirsium occidentale	Western thistle
Cirsium vulgare	Bull thistle
Cnicus benedictus	Blessed thistle
Conyza canadensis	Horseweed
Coreopsis bigelovii	Bigelow's coreopsis
Encelia farinosa	Brittlebush
Ericameria linearifolia	Interior goldenbush

Eriophyllum confertiflorum	Golden yarrow
Filago californica	Herba impia
Gnaphalium californicum	Green cudweed
Gnaphalium canescens ssp. *microcephalum*	White cudweed
Gutierrezia californica	California matchweed
Helianthus annuus	Sunflower
Helianthus nuttallii ssp. *nuttallii*	Nuttall's sunflower
Hemizonia fasciculata	Tarweed
Heterotheca grandiflora	Telegraph weed
Heterotheca sessiliflora ssp. *echioides*	Goldenaster
Lactuca serriola	Prickly lettuce
Lepidospartum squamatum	Scale-broom
Lessingia filaginifolia var. *filaginifolia*	California aster
Malacothrix glabrata	Desert dandelion
Malacothrix saxatilis var. *tenuifolia*	Malacothrix
Picris echioides	Bristly ox-tongue
Pluchea sericea	Arrow weed
Senecio flaccidus var. *douglasii*	Bush groundsel
Silybum marianum	Milk thistle
Sonchus asper	Prickly sow thistle
Sonchus oleraceus	Common sow thistle
Stephanomeria exigua ssp. *exigua*	Stephanomeria
Stephanomeria pauciflora	Wire-lettuce
Xanthium strumarium var. *canadensis*	Cocklebur
BIRCH FAMILY - BETULACEAE	
Alnus rhombifolia	White alder
BORAGE FAMILY - BORAGINACEAE	
Amsinckia menziesii var. *intermedia*	Rancher's fireweed
Cryptantha intermedia	Cryptantha
Heliotropium curassavicum	Heliotrope
Plagiobothrys sp.	Popcorn flower

MUSTARD FAMILY - BRASSICACEAE	
Brassica nigra	Black mustard
Brassica rapa	Field mustard
Capsella bursa-pastoris	Shepherd's purse
Descurainia pinnata	Tansy mustard
Erysimum capitatum	Western wallflower
Lepidium latifolium	Tall peppergrass
Lobularia maritima	Sweet alyssum
Rorippa nasturtium-aquaticum	Water cress
Sisymbrium altissimum	Tumble mustard
Sisymbrium irio	London rocket
Sisymbrium orientale	Hare's ear cabbage
Thysanocarpus laciniatus var. *crenatus*	Lacepod
CACTUS FAMILY - CACTACEAE	
Opuntia basilaris var. *basilaris*	Beavertail
Opuntia basilaris var. *brachyclada*	Short-joint beavertail
Opuntia littoralis	Tuna cactus
Opuntia prolifera	Cholla
CAPER FAMILY - CAPPARACEAE	
Isomeris arborea	Bladderpod
HONEYSUCKLE FAMILY - CAPRIFOLIACEAE	
Lonicera interrupta	Chaparral honeysuckle
Sambucus mexicana	Blue elderberry
PINK FAMILY - CARYOPHYLLACEAE	
Spergularia bocconnii	Sand-spurrey
GOOSEFOOT FAMILY - CHENOPODIACEAE	
Atriplex canescens	Fourwing saltbush
Atriplex serenana	Bractscale
Chenopodium album	Pigweed
Chenopodium ambrosioides	Mexican tea
Chenopodium berlandieri	Pitseed goosefoot

Chenopodium botrys	Jerusalem oak
Chenopodium murale	Goosefoot
Salsola tragus	Russian thistle
MORNING-GLORY FAMILY - CONVOLVULACEAE	
Calystegia macrostegia ssp. *arida*	Morning-glory
Calystegia macrostegia ssp. *macrostegia*	Morning-glory
Calystegia peirsonii	Peirson's Morning-glory
STONECROP FAMILY - CRASSULACEAE	
Crassula connata	Pygmy-weed
Dudleya lanceolata	Lance-leaved dudleya
GOURD FAMILY - CUCURBITACEAE	
Brandegea bigelovii	Brandegea
Cucurbita foetidissima	Calabazilla
Marah macrocarpus	Man-root
DODDER FAMILY - CUSCUTACEAE	
Cuscuta californica	California dodder
TEASEL FAMILY - DIPSACACEAE	
Dipsacus fullonum	Wild teasel
HEATH FAMILY - ERICACEAE	
Arctostaphylos sp.	Manzanita
SPURGE FAMILY - EUPHORBIACEAE	
Chamaesyce albomarginata	Spurge
Chamaesyce polycarpa	Sand mat
Croton californicus	Croton
Eremocarpus setigerus	Turkey mullein
LEGUME FAMILY - FABACEAE	
Astragalus didymocarpus	Two-seeded milkvetch
Astragalus trichopodus	Milkvetch
Lotus corniculatus	Birdfoot trefoil
Lotus nuttallianus	Nuttall's lotus
Lotus purshianus	Trefoil

Lotus salsuginosus	Trefoil
Lotus scoparius	California broom
Lupinus bicolor	Miniature lupine
Lupinus hirsutissimus	Stining lupine
Lupinus sparsiflorus	Coulter's lupine
Lupinus succulentus	Arroyo lupine
Medicago sativa	Alfalfa
Melilotus alba	White sweetclover
Melilotus indica	Sourclover
Melilotus officinalis	Yellow sweetclover
Trifolium gracilentum	Clover
OAK FAMILY - FAGACEAE	
Quercus agrifolia	Coast live oak
Quercus berberidifolia	Scrub oak
Quercus lobata	Valley oak
GERANIUM FAMILY - GERANIACEAE	
Erodium cicutarium	Storksbill
GOOSEBERRY FAMILY - GROSSULARIACEAE	
Ribes malvaceum	Chaparral currant
WATERLEAF FAMILY - HYDROPHYLLACEAE	
Emmenanthe pendiflora	Whispering bells
Eriodictyon crassifolium	Thickleaf yerba santa
Eriodictyon trichocalyx var. *trichocalyx*	Hairy yerba santa
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	Eucrypta
Nemophila menziesii	Baby blue-eyes
Phacelia cicutaria var. *hispida*	Phacelia
Phacelia distans	Common phacelia
Phacelia fremontii	Fremont's phacelia
Phacelia minor	Wild canterbury-bell
Phacelia parryi	Parry's phacelia
Phacelia ramossissima	Heliotrope

Pholistoma auritum	Blue fiesta flower
WALNUT FAMILY - JUGLANDACEAE	
Juglans californica	California black walnut
MINT FAMILY - LAMIACEAE	
Marrubium vulgare	Horehound
Mentha arvensis	Spearmint
Salvia apiana	White sage
Salvia columbariae	Chia
Salvia leucophylla	Purple sage
Salvia mellifera	Black sage
Stachys albens	Hedge nettle
Trichostema lanatum	Wooly bluecurls
Trichostema lanceolatum	Vinegar weed
Trichostema parishii	Mountain bluecurls
LOASA FAMILY - LOASACEAE	
Mentzelia laevicaulis	Blazing star
Petalonyx thurberi ssp. *thurberi*	Sandpaper bush
MALLOW FAMILY - MALVACEAE	
Malacothamnus densiflorus	Many-flowered bush mallow
Malacothamnus fasciculatus	Chaparral mallow
Malacothamnus marrubioides	Bush mallow
Malva parvaflora	Cheeseweed
Malvella leprosa	Alkali-mallow
MYRTLE FAMILY - MYRTACEAE	
Eucalyptus sp.	Eucalyptus
FOUR O'CLOCK FAMILY - NYCTAGINACEAE	
Mirabilis californica	Wishbone bush
EVENING PRIMROSE FAMILY - ONAGRACEAE	
Camissonia californica	Sun cup
Clarkia bottae	Punchbowl godetia
Clarkia purpurea ssp. *quadrivulnera*	Four-spot

Clarkia unguiculata	Farewell-to-spring
Epilobium ciliatum ssp. *ciliatum*	Willow herb
Oenothera californica	California evening primrose
Oenothera elata ssp. *hookeri*	Evening primrose
POPPY FAMILY - PAPAVERACEAE	
Argemone munita	Chicalote
Dendromecon rigida	Bush poppy
Eschscholzia californica	California poppy
PLANTAIN FAMILY - PLANTAGINACEAE	
Plantago lanceolata	English plantain
Plantago major	Common plantain
SYCAMORE FAMILY - PLATANACEAE	
Platanus racemosa	Western sycamore
PHLOX FAMILY - POLEMONIACEAE	
Eriastrum densifolium ssp. *austromontanum*	Blue gilia
Gilia capitata	Ball gilia
Linanthus dianthiflorus	Ground pink
BUCKWHEAT FAMILY - POLYGONACEAE	
Chorizanthe staticoides	Turkish rugging
Eriogonum brachyanthum	Buckwheat
Eriogonum davidsonii	Davidson's buckwheat
Eriogonum elongatum	Long-stemmed buckwheat
Eriogonum fasciculatum var. *fasciculatum*	California buckwheat
Eriogonum fasciculatum var. *foliolosum*	Interior flat-topped buckwheat
Eriogonum maculatum	Buckwheat
Polygonum arenastrum	Common knotweed
Polygonum lapathifolium	Willow weed
Rumex crispus	Curly dock
Rumex hymenosepalus	Canaigre
Rumex salicifolius	Willow dock

PURSLANE FAMILY - PORTULACACEAE	
Claytonia perfoliata	Miner's lettuce
BUTTERCUP FAMILY - RANUNCULACEAE	
Delphinium parshii	Desert larkspur
BUCKTHORN FAMILY - RHAMNACEAE	
Ceanothus crassifolius	Hoaryleaf ceanothus
Ceanothus leucodermis	Chaparral whitethorn
Ceanothus oliganthus	California lilac
Rhamnus californica ssp. *californica*	California coffeeberry
Rhamnus ilicifolia	Holly-leaf redberry
ROSE FAMILY - ROSACEAE	
Adenostoma fasciculatum	Chamise
Cercocarpus betuloides	Mountain-mahogany
Prunus ilicifolia	Cherry
Rosa californica	California rose
Rubus parviflorus	Thimbleberry
MADDER FAMILY - RUBIACEAE	
Galium angustifolium ssp. *angustifolium*	Narrow-leaved bedstraw
WILLOW FAMILY - SALICACEAE	
Populus fremontii spp. *fremontii*	Fremont cottonwood
Salix exigua	Narrow-leaved willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
Salix lucida ssp. *lasiandra*	Shining willow
FIGWORT FAMILY - SCROPHULARIACEAE	
Mimulus aurantiacus	Bush monkeyflower
Mimulus cardinalis	Cardinal monkeyflower
Mimulus guttatus	Monkeyflower
Verbascum thapsus	Woolly mullein
Veronica anagallis-aquatica	Water speedwell

SIMAROUBA FAMILY - SIMAROUBACEAE	
Ailanthus altissima	Tree of heaven
NIGHTSHADE FAMILY - SOLANACEAE	
Datura wrightii	Thorn-apple
Nicotiana glauca	Tree tobacco
Nicotiana quadrivalvis	Tobacco
Solanum americanum	Nightshade
Solanum douglasii	Nightshade
Solanum umbelliferum	Nightshade
TAMARISK FAMILY - TAMARICACEAE	
Tamarix ramosissima	Tamarisk
NETTLE FAMILY - URTICACEAE	
Urtica dioica ssp. *holosericea*	Hoary nettle
MISTLETOE FAMILY - VISCACEAE	
Phoradendron macrophyllum	Big leaf mistletoe
CALTROP FAMILY - ZYGOPHYLLACEAE	
Tribulus terrestris	Puncture vine
MONOTYLEDONES	
SEDGE FAMILY - CYPERACEAE	
Carex alma	Sedge
Cyperus eragrostis	Nutsedge
Eleocharis parishii	Spikerush
Scirpus americanus	Bulrush
Scirpus californicus	Bulrush
Scirpus microcarpus	Bulrush
RUSH FAMILY - JUNCACEAE	
Juncus bufonius	Toad rush
Juncus mexicanus	Mexican rush
Juncus xiphioides	Iris-leaved rush
DUCKWEED FAMILY - LEMNACEAE	
Lemna minor	Duckweed

LILY FAMILY - LILIACEAE	
Bloomeria crocea	Common goldenstar
Calochortus luteus	Mariposa lily
Dichelostemma capitatum	Blue dicks
Yucca whipplei ssp. *cespitosa*	Our lord's candle
Yucca whipplei ssp. *parishii*	Our lord's candle
GRASS FAMILY - POACEAE	
Agrostis viridis	Bent grass
Arundo donax	Giant reed
Avena barbata	Slender wild oats
Avena fatua	Wild oat
Bromus diandrus	Ripgut grass
Bromus hordeaceus	Brome
Bromus madritensis ssp. *rubens*	Foxtail chess
Bromus tectorum	Cheat grass
Cynodon dactylon	Bermuda grass
Echinochloa crus-galli	Barnyard grass
Hordeum murinum ssp. *leporinum*	Barley
Leptochloa uninervia	Mexican sprangletop
Lolium multiflorum	Italian ryegrass
Melica californica	California melic
Melica imperfecta	Oniongrass
Nassella cernua	Nodding needlegrass
Orcuttia californica	California orcutt grass
Polypogon monspeliensis	Annual beard grass
Schismus barbatus	Mediterranean grass
Sorghum halepense	Johnsongrass
CATTAIL FAMILY - TYPHACEAE	
Typha domingensis	Southern cattail
Typha latifolia	Broad-leaved cattail

Invertebrate Fauna of the Study Area

Locality Column (Beeflies)

HN Haskell Canyon, north; station 7
HS Haskell Canyon, south; station 7
ON Oak Spring Canyon, north; station 10
OS Oak Spring Canyon, south; station 10
S Santa Clara River bank; stations 1,2,3,4,12
VP Santa Clara River bank; station 5
M Mint Canyon; stations 6,6A
R Santa Clara River bank; station 8
A North facing shallow canyon; station 9
C Chaparral; station 11
SS Santa Susanna mountains; station 13
D Desert ecotone; station 14

Sighted column (Butterflies)

- Species sighted in the study area during surveys by SMEA personnel during the study period.

Adult Flight Period Column (Beeflies)
Flight Column (Butterflies)

These are the times that the adults are seen flying in the field.

Status Column (Butterflies)

FE Listed as endangered by the federal government (U.S. Fish and Wildlife Service).
FT Listed as threatened by the federal government (U.S. Fish and Wildlife Service).
FP A petition has been submitted to the U.S. Fish and Wildlife Service proposing this species for endangered status.
C2 Category 2 candidate species for federal listing (taxa for which existing information indicates the taxon may warrant listing but for which substantial biological information to support a proposed rule is lacking).
CE Listed as endangered by the State of California
CP Fully Protected in California - a designation given prior to the enactment of the State of California Endangered Species Act.
SC California Department of Fish and Game Species of Special Concern.

Dist. = General Distribution Column (Butterflies)

WS widespread, found everywhere
NA widespread but only in undisturbed habitat
LO localized in colonies
RM regular migrants usually found every year
SM sporadic or rare migrants

Beeflies of the Study Area

The following table lists all the species of beeflies (Bombyliidae) captured and identified at the trap stations. The number of beefly species at any southern California locality approximates the number of species of butterflies. Beeflies should have an increasing role in biota assessment because of the many ecological roles in their larval stages, the adult role in pollination, the ease of field identification of larger species and their diversity. The following table includes all species from the study area which have been confirmed by collections made by Dr. Rudolf Mattoni of the SMEA study team.

Species	Locality	Adult Flight Period
Bombylius major	All Sites	March - April
Bombylius anthophillis	All Sites	March - April
Bombylius breviabdominalis	O,L	June
Bombylius curtiryrinchus	O,H	March - April
Bombylius montanus	O,L	June
Bombylius sp.	H,M	March
Heterostylum robustum	O,H,M	May - June
Lordotus planus	O	April - May
Lordotus gibbus striatus	H	September - October
Aphoebantus sp.	H	March - April
Aphoebantus mus	O	May - June
Pthiria sp.	H	September
Mythicomyia sp.	H	May -June
Conophorus fenestratus	O	March - April
Conophorus nigripennis	O	March - April
Toxophora virgata	O	July - August
Lordotus miscellus	O	September - October
Anthrax vericolor	O	April - May
Lepidanthrax sp. nr. *orbites*	O,H,D,S	June
Villa lateralis	O	July - August
Villa nr. *molitor*	O,H	July - September
Paravilla fulvacomma	O	May - June

Paravilla fumosa	H	August - September
Chrysanthrax adumbrata	O,H	September
Chrysanthrax vana	O	July
Thyridanthrax nugator	O	June - August
Thyridanthrax atrata	R,H	July - August
Hemipenthes lepidota	O	August - September
Hemipenthes sinuosa	O	August - September
Poecilanthrax autumnalis	O,H	August - September
Poecilanthrax pilosus	O	August - September
Poecilanthrax signatapennis	H	August - September
Exoprosopa doris	O,S	June
Exoprosopa jonesi	D	May -June
Chrysanthrax levicula	S	June
Chrysanthrax junctura	O	September
Geron sp.	VP	May -June

Butterflies of the Study Area

The following table lists all the species of butterflies which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, the adult flight time of the species, whether or not the species possesses a special conservation status and the general distribution of the species. The taxonomy and use of common names follows Mattoni (1990).

Species	Scientific Name	Sighted	Flight	Status	Dist.
SWALLOWTAIL BUTTERFLIES - PAPILIONIDAE					
Anise Swallowtail	*Papilio zelicaon*	●	JAN - DEC		WS
Western Tiger Swallowtail	*Papilio rutulus rutulus*	●	FEB - OCT		WS
Pale Swallowtail	*Papilio eurymedom*	●	FEB - OCT		NA
WHITES AND SULFURS - PIERIDAE					
Cabbage Butterfly	*Pieris rapae*	●	JAN - DEC		WS
Becker's White	*Pieris beckerii*	●	FEB - AUG		NA
Common White	*Pieris protodice*	●	JAN - DEC		WS
Sara Orange Tip	*Anthocharis sara sara*	●	FEB - JUN		NA
Desert Orange Tip	*Anthocharis cethura cethura*		FEB - APR		LO
Alfalfa Butterfly	*Colias eurytheme*	●	JAN - DEC		WS
Harford's Sulfur	*Colias alexandra harfordi*	●	MAR - SEP		NA
California Dogface[2]	*Zerene eurydice*	●	MAR - SEP		NA
Cloudless Sulfur	*Phoebis sennae marcellina*		MAR - OCT		WS
Nicippe Sulfur	*Eurema nicippe*		FEB - NOV		WS
Dwarf Yellow	*Nathalis iole*		MAR - OCT		RM
BRUSH-FOOTED BUTTERFLIES - NYMPHALIDAE					
Striated Queen	*Danaus gilippus strigosus*	●	MAR - NOV		RM
Monarch	*Danaus plexippus*	●	JAN - DEC		WS
California Ringlet	*Coenonympha tullia california*	●	FEB - SEP		NA
Sylvan Satyr	*Cercyonis sthenele silvestris*	●	MAY - AUG		NA
Gulf Fritillary	*Agraulis vanillea incarnata*	●	MAR - NOV		WS
Comstock's Fritillary[3]	*Argynnis callippe comstocki*		MAY - JUN		LO

Chaledona Checkerspot	*Euphydryas chalcedona chalcedona*	●	MAY - JUN		LO
Gabb's Checkerspot	*Chlosyne gabbii gabbii*	●	MAR - JUN	Rare[1]	LO
Wright's Leanira Checkerspot	*Chlosyne leanira wrightii*		MAR - MAY		LO
Red Admiral	*Vanessa atalanta*	●	MAR - NOV		WS
Painted Lady	*Vanessa cardui*	●	FEB - NOV		WS
West Coast Lady	*Vanessa carye anabella*	●	JAN - DEC		WS
Virginia Lady	*Vanessa virginiensis*	●	JAN - DEC		WS
Mourning Cloak	*Nymphalis antiopa*	●	JAN - DEC		WS
Milbert's Tortoiseshell	*Nymphalis milberti*		JUN - JUL		WS
California Tortoiseshell	*Nymphalis californica*		?		VM
Satyr anglewing	*Polygonia satyrus satyrus*	●	JUN - APR		LO
Buckeye	*Precis coenia*	●	MAR - NOV		WS
Lorquin's Admiral	*Liminitis lorquini lorquini*	●	APR - SEP		LO
California Sister	*Adelpha bredowii*	●	MAR - OCT		LO
BLUES, COPPERS AND HAIRSTREAKS - LYCAENIDAE					
Behr's Metalmark	*Apodemia mormo virgulti*	●	MAR - OCT		LO
Dusky Metalmark	*Calephelis nemesis*		FEB - OCT		LO
Great Purple Hairstreak[4]	*Atlides halesus corcorani*		MAR - OCT		NA
Common Hairstreak	*Strymon melinus pudica*	●	FEB - NOV		WS
California Hairstreak	*Satyrium californicum*	●	MAY - JUL	Rare[1]	LO
Sylvan Hairstreak	*Satyrium sylvinus dryope*	●	MAY - JUL		LO
Nut Brown Hairstreak	*Satyrium auretorum spadix*		MAY - JUL		LO
Grey Hairstreak	*Satyrium tetra*	●	MAY - JUL		NA
Buckthorn Hairstreak	*Satyrium saepium saepium*	●	MAY - JUL		NA
Western Elfin	*Callophyrs augustus iroides*	●	FEB - JUN		NA
California Green Hairstreak	*Callophrys affinis perplexa*	●	MAR - APR		NA
Arota Copper	*Lycaena arota arota*	●	MAY - JUL		LO
Gorgon Copper	*Lycaena gorgon*	●	MAY - JUN		LO
Purplish Copper[5]	*Lycaena helloides*		APR - OCT		LO
Great Copper	*Lycaena xanthoides xanthoides*	●	MAY - JUL		LO

Pigmy Blue	*Brephidium exilus*	●	FEB - NOV		NA
Marina Blue	*Leptotes marina*	●	JAN - DEC		WS
Western Tailed Blue	*Everes amyntula*	●	FEB - SEP		LO
Acmon Blue	*Plebejus acmon acmon*	●	FEB - NOV		NA
Lupine Blue	*Plebejus lupini monticola*	●	MAY - JUL		NA
San Emigdio Blue	*Plebejus emigdionis*	●	MAR - MAY	C2	LO
Southern Blue	*Glaucopsyche lygdamus australis*	●	FEB - APR		LO
Bernardino Blue	*Euphilotes bernardino bernardino*	●	APR - JUL		LO
Sonora Blue	*Philotes sonorensis*		FEB - APR		LO
Echo Blue	*Celastrina argiolus echo*	●	FEB - JUN		NA
SKIPPERS - HESPERIDAE					
Fiery Skipper	*Hylephila phyleus*	●	JAN - DEC		WS
Leussler's Skipper	*Hesperia comma*		MAY - AUG		LO
Columbia Skipper	*Hesperia columbia*		MAR - MAY AUG - OCT		LO
Sandhill Skipper	*Polites sabuleti sabuleti*	●	APR - SEP		LO
Field Skipper	*Atalopetes campestris*	●	APR - NOV		NA
Woodland Skipper	*Ochlodes sylvanoides sylvanoides*	●	JUL - SEP		NA
Rural Skipper	*Ochlodes agricola agricola*	●	APR - JUL		NA
Umber Skipper	*Paratrytone melane*		APR - SEP		NA
Mournful Duskywing	*Erynnis tristis tristis*		FEB - SEP		NA
Western Oak Duskywing	*Erynnis propterius propterius*	●	MAR - MAY		NA
Funereal Duskywing	*Erynnis zarucco funeralis*	●	FEB - OCT		NA
Western Checkered Skipper	*Pyrgus communis albescens*	●	FEB - OCT		NA
Large White Skipper	*Heliopetes ericetorum*	●	APR - OCT		NA
Common Sootywing Skipper	*Pholisora catullus*		APR - SEP		LO

[1] There were two important nonlisted species collected during SMEA surveys. The California hairstreak and Gabb's checkerspot. The collection of the California hairstreak,

Satyrium californicum, represents a very significant range extension and an altitude shift. The nearest previously recorded populations were from elevations over 2,500 feet in the San Gabriel mountains and along the highest ridges of the Liebre mountains. Its foodplant includes valley oak and it may also require an ant symbiont. Although not globally threatened, the species is vulnerable at many sites. Gabb's checkerspot, *Chlosyne gabbii gabbii*, was formerly a common widespread butterfly but is now found locally in the Santa Clara River drainage. A small colony was located in Mint Canyon during 1993, but the species did not fly in 1994. It is very sensitive to disturbance and disappears with even slight land modification. However, the causes of the decline are obscure as its foodplants (perennial native asters) remain common and widespread.

[2] This species (California dogface, *Zerene eurydice*) still occurs in the study site, however, the species is in general decline near development as its foodplant (false indigo, *Amorpha*) is cleared from oak understory.

[3] Comstock's fritillary, *Argynnis callippe comstocki*, is declining throughout cis-montaine southern California. This species was formerly common across the Simi hills and to the east in upper Bouquet Canyon. This species was not found during SMEA surveys but it should occur on the study site as its foodplant, *Viola pedunculata*, occurs in the oak woodland.

[4] Although not collected during SMEA surveys, the great purple hairstreak, *Atlides halesus corcorani*, undoubtedly occurs within the study site and adults are likely to be relatively common, however it is only rarely seen when visiting flowers. It's foodplant (mistletoe) is present throughout the study area.

[5] The purplish copper, *Lycaena helloides*, was formerly common along most watercourses. There are no records from the Santa Clara River riparian zone but it must have occurred there in the past. Some foodplant (docks and *Polygonum*) is still found along the existing riparian zone and there is suitable habitat. This species may be extirpated from the region.

Vertebrate Fauna of the Study Area

The known and expected fauna of the study area is tabulated on the following pages. The symbols/abbreviations listed below are used for each of the faunal tables.

Sighted column

- ● Species sighted in the study area during surveys by SMEA personnel during the study period.

- ○ Signs (tracks, scat) of species seen in the study area during surveys by SMEA personnel during the study period.

- ? Uncertainty as to some aspect of the record.

Survey column

This column references data on the occurrence of species whose presence has been documented by other surveys/observations conducted on properties containing similar habitats that are close to or contiguous with habitats of the study site. In some cases the references contain data from surveys conducted within the study area. These data provide an indication of species that are likely to occur within the study site even if they were not seen during surveys conducted by SMEA personnel during the study period.

The numbers in the table refer to the following sources of information:

1. Guthrie, D. 1993. Bird surveys along the Santa Clara River and its tributaries near Valencia, California, 1993. Report prepared for Valencia Corporation. 22p.

2. Henrickson, J., D. Guthrie, and D. Soltz. 1988. Biological resources along those portions of the Santa Clara River, south fork of the Santa Clara River, San Francisquito Creek, and Castaic Creek controlled by Newhall Land and Farming Company. Report prepared for Newhall Land and Farming Company. 74p. + figures.

3. Observations of SMEA personnel in areas adjacent to the study area within the last 5 years.

4. Weintraub, J. and T Hanes. 1991. Vesting tentative tract no. 43896 Los Angeles, California, Dale Poe Development Corporation. SEATAC Supplemental Report No. 2. Report prepared for County of Los Angeles Department of Regional Planning. 35p.

5. Placerita Canyon species lists compiled by the Los Angeles County Department of Parks and Recreation. The following lists were used:
   A) Lizards of Placerita Canyon.
   B) Placerita Canyon Nature Center: The Lizards of Placerita Canyon.
   C) Placerita Canyon Nature Center Snake Checklist, for the canyon and adjacent areas.
   D) Los Angeles County Natural Areas, Parks, and Sanctuaries Sensitive Animals Species Matrix.

Status column

FE Listed as endangered by the federal government (U.S. Fish and Wildlife Service).
FT Listed as threatened by the federal government (U.S. Fish and Wildlife Service).
FP A petition has been submitted to the U.S. Fish and Wildlife Service proposing this species for endangered status.
BA Protected by a 1963 amendment to the Bald Eagle Act of 1943.
C2 Category 2 candidate species for federal listing (taxa for which existing information indicates the taxon may warrant listing but for which substantial biological information to support a proposed rule is lacking).
CE Listed as endangered by the State of California
CP Fully Protected in California - a designation given prior to the enactment of the State of California Endangered Species Act.
SC California Department of Fish and Game Species of Special Concern.

Fishes of the Study Area

The following table lists all the species of fishes which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, whether the species has been documented on similar habitat adjacent to the study area and whether or not the species possesses a special conservation status. The taxonomy and use of common names follows Robins *et al* (1991).

Species	Scientific Name	Sighted	Survey	Status
MINNOWS - CYPRINIDAE				
Arroyo Chub	*Gila orcutti*	●	3	SC
SUCKERS - CATOSTOMIDAE				
Santa Ana Sucker	*Catostomus santaanae*	●	3	FP,C2,SC
KILLIFISHES - CYPRINODONTIDAE				
Mosquitofish	*Gambusia affinis*	●	3	
STICKLEBACKS - GASTEROSTEIDAE				
Unarmored Threespine Stickleback	*Gasterosteus aculeatus williamsoni*	●	3	FE,SE
SCULPINS - COTTIDAE				
Prickly Sculpin	*Cottus asper*	●	3	

Amphibians of the Study Area

The following table lists all the species of amphibians which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, whether the species has been documented on similar habitat adjacent to the study area and whether or not the species possesses a special conservation status. The taxonomy and use of common names follows Stebbins (1985).

Species	Scientific Name	Sighted	Survey	Status
NEWTS - SALAMANDRIDAE				
Coast Range Newt	*Taricha torosa torosa*			SC
LUNGLESS SALAMANDERS - PLETHODONTIDAE				
Ensatina	*Ensatina eschscholtzii*			
Arboreal Salamander	*Aneides lugubris*			
Black-bellied Slender Salamander	*Batrachoseps nigriventris*			
Pacific Slender Salamander	*Batrachoseps pacificus major*		2	
SPADEFOOT TOADS AND ALLIES - PELOBATIDAE				
Western Spadefoot	*Scaphiopus hammondii*	●	5	SC
TRUE TOADS - BUFONIDAE				
California Toad	*Bufo boreas halophilus*	●	2	
Arroyo Southwestern Toad	*Bufo microscaphus californicus*			C1,SC
TREEFROGS AND ALLIES - HYLIDAE				
California Treefrog	*Hyla (Pseudacris) cadaverina*			
Pacific Treefrog	*Hyla (Pseudacris) regilla*	●	2	
TRUE FROGS - RANIDAE				
California Red-legged Frog	*Rana aurora draytonii*			FP,F1,SC
Bullfrog	*Rana catesbeiana*	●		
TONGUELESS FROGS - PIPIDAE				
African Clawed Frog	*Xenopus laevis*	●		

Reptiles of the Study Area

The following table lists all the species of reptiles which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, whether the species has been documented on similar habitat adjacent to the study area and whether or not the species possesses a special conservation status. The taxonomy and use of common names follows Stebbins (1985).

Species	Scientific Name	Sighted	Survey	Status
BOX AND WATER TURTLES - EMYDIDAE				
Southwestern Pond Turtle	*Clemmys marmorata pallida*		3,5	C2,SC
GECKOS - GEKKONIDAE				
San Diego Banded Gecko	*Coleonyx variegatus abbotti*		5?	
IQUANIDS - IGUANIDAE				
Great Basin Collared Lizard	*Crotaphytus insularis bicinctores*[1]			
Great Basin Fence Lizard	*Sceloperus occidentalis biseriatus*	●	4,5	
Side-blotched Lizard	*Uta stansburiana*	●	4,5	
California Horned Lizard	*Phrynosoma coronatum frontale*	○?[2]		SC
San Diego Horned Lizard	*Phrynosoma coronatum blainvillei*	○?[2]	3,5	C2,SC
SKINKS - SCINCIDAE				
Skilton Skink	*Eumeces skiltonianus skiltonianus*		5	
WHIPTAILS AND ALLIES - TEIDAE				
Coastal Whiptail	*Cnemidophorus tigris multiscutatus*	●	3,4,5	C2
ALLIGATOR LIZARDS AND ALLIES - ANGUIDAE				
San Diego Alligator Lizard	*Gerrhonotus multicarinatus webbi*		2,3,4,5	
CALIFORNIA LEGLESS LIZARDS - ANNIELLIDAE				
Silvery Legless Lizard	*Anniella pulchra pulchra*		5	SC
SLENDER BLIND SNAKES - LEPTOTYPHLOPIDAE				
Western Blind Snake	*Leptotyphlops humilis humilis*		5	
BOAS - BOIDAE				
Coastal Rosy Boa	*Lichanura trivirgata roseofusca*		5	

COLUBRIDS - COLUBRIDAE				
San Bernadino Ringneck Snake	*Diadophis punctatus modestus*		5	C2
Western Yellow-bellied Racer	*Coluber constrictor mormon*		5	
Red Coachwhip	*Masticophis flagellum piceus*	●	3,5	
Chaparral Whipsnake	*Masticophis lateralis lateralis*		4,5	
Coast Patch-nosed Snake	*Salvadora hexalepis virgultea*		2,5	C2,SC
California Glossy Snake	*Arizona elegans occidentalis*		4	
San Diego Gopher Snake	*Pituophis melanoleucus annectens*		2,3,5	
California Kingsnake	*Lampropeltis getulus californiae*		3,5	
San Diego Mountain Kingsnake	*Lampropeltis zonata pulchra*		5	SC
Western Long-nosed Snake	*Rhinocheilus lecontei*		5	
California Red-sided Garter Snake	*Thamnophis sirtalis infernalis*			SC
Hammond Two-striped Garter Snake	*Thamnophis hammondii hammondii*	●	3,5	C2,SC
California Black-headed Snake	*Tantilla planiceps*		5	
Lyre Snake	*Trimorphodon biscutatus*		5	
Night Snake	*Hypsiglena torquata*		5	
VIPERS - VIPERIDAE				
Southern Pacific Rattlesnake	*Crotalus viridus helleri*	●	3,5	

[1] The Great basin collared lizard has been reported from Sand Canyon. The occurrence of this lizard species along with some plant species (*Artemisia tridentata* ssp. *parishii, Chrysothamnus nauseosus, Ericameria linearifolia*, and *Petalonyx thurberi* ssp. *thurberi*) represent an eastward expansion of desert biota. There is also an unconfirmed report of the zebra-tailed lizard, *Callisaurus draconoides*, from Rabbit Canyon, a side canyon of Sand Canyon (cited in The Lizards of Placerita Canyon produced by the Los Angeles County Department of Parks and Recreation). There are other records of desert species nearby: common chuckwalla, *Sauromalus obesus*, at Vasquez Rocks Park; desert night lizard, *Xantusia vigilis*, at Vasquez Rocks; and desert horned lizard, *Phrynosoma platyrhinos*, in Soledad Canyon. Such occurrences suggest the importance of the Santa Clara River valley as a plant and animal dispersal route between the high desert and the interior cismontane region of Los Angeles County. Similar range extensions of the desert biota have been documented in Cajon Wash/Lytle Creek areas of the upper Santa Ana River drainage.

[2] The open circle indicates that the animals were not seen and only scat was located. The The question mark is present because although the scat is undoubtedly that of *Phrynosoma coronatum*, it could not be determined on the basis of the scat which subspecies was present.

This area of northern Los Angeles County is normally considered an intergrade zone between the two subspecies. Despite the potential that this is an intergraded population, resource agencies will generally give the population the status of the most sensitive of the two subspecies.

Birds of the Study Area

The following table lists all the species of birds which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, whether the species has been documented on similar habitat adjacent to the study area and whether or not the species possesses a special conservation status. Taxonomy and use of common names primarily follows The American Ornithologists Union Check-list of North American Birds (1983).

Species	Scientific Name	Sighted	Survey	Status
GREBES - PODICIPEDIDAE				
Pied-billed Grebe	*Podilymbus podiceps*			
PELICANS - PELECANIDAE				
American White Pelican	*Pelecanus erythrorhynchos*			SC
CORMORANTS - PHALACROCORACIDAE				
Double-crested cormorant	*Phalacrocorax auritus*			SC
BITTERNS AND HERONS - ARDEIDAE				
Great Blue Heron	*Ardea herodias*	●	2	
Great Egret	*Casmerodius albus*		2,3	
Snowy Egret	*Egretta thula*		2,3	
Green Heron	*Butorides virescens*	●	1,2	
Black-crowned Night Heron	*Nycticorax nycticorax*		1,3	
SWANS, GEESE AND DUCKS - ANATIDAE				
Canada Goose	*Branta canadensis*	●		
Mallard	*Anas platyrhynchos*	●	1,2	
Cinnamon Teal	*Anas cyanoptera*	●	1	
American Widgeon	*Anas americana*	●		
Green-winged Teal	*Anas crecca*			
Northern Pintail	*Anas acuta*			
Northern Shoveler	*Anas clypeata*			
Gadwall	*Anas strepera*			
Ring-necked Duck	*Aythya collaris*			
Lesser Scaup	*Aythya affinis*			

Bufflehead	*Bucephala albeola*		3	
Common Merganser	*Mergus merganser*			
AMERICAN VULTURES - CATHARTIDAE				
Turkey Vulture	*Cathartes aura*	●	1,2,4	
California Condor	*Gymnogyps californianus*			FE,CE,CP
KITES, EAGLES, HAWKS AND ALLIES - ACCIPITRIDAE				
Osprey	*Pandion haliaetus*	●		SC
White-tailed Kite	*Elanus leucurus*	●	2,5	CP,SC
Northern Harrier	*Circus cyaneus*	●	5	SC
Sharp-shinned Hawk	*Accipiter striatus*	●	2,5	SC
Cooper's Hawk	*Accipiter cooperii*	●	1,2,4,5	SC
Red-shouldered Hawk	*Buteo lineatus*	●	1,2	
Red-tailed Hawk	*Buteo jamaicensis*	●	1,2,4	
Golden Eagle	*Aquila chrysaetos*	●	1,5	BA,CP,SC
CARACARAS AND FALCONS - FALCONIDAE				
American Kestrel	*Falco sparverius*	●	1,2	
Merlin	*Falco columbarius*			SC
Prairie Falcon	*Falco mexicanus*		5	SC
American Peregrine Falcon	*Falco peregrinus anatum*		3	FE,CP,CE
PARTRIDGES, GROUSE, TURKEY AND QUAIL - PHASIANIDAE				
California Quail	*Callipepla californica*	●	1,2,4	
Mountain Quail	*Oreortyx pictus*		5	
RAILS, GALLINULES AND COOTS - RALLIDAE				
Virginia Rail	*Rallus limicola*		2	
Sora	*Porzana carolina*		3	
Common Moorhen	*Gallinula chloropus*			
American Coot	*Fulica americana*	●		
STILTS AND AVOCETS - RECURVIROSTRIDAE				
Black-necked Stilt	*Himantopus mexicanus*			
PLOVERS AND LAPWINGS - CHARADRIIDAE				
Killdeer	*Charadrius vociferus*	●	1,2	

SANDPIPERS, PHALAROPES AND ALLIES - SCOLOPACIDAE				
Greater Yellowlegs	*Tringa melanoleuca*		1	
Spotted Sandpiper	*Actitis macularia*	●	1,2,3	
Least Sandpiper	*Calidris minutilla*	●	1	
Common Snipe	*Gallinago gallinago*		2	
Solitary Sandpiper	*Tringa solitaria*			
Western Sandpiper	*Calidris mauri*			
Long-billed Dowitcher	*Limnodromus scolopaceus*			
SKUAS, GULLS, TERNS AND SKIMMERS - LARIDAE				
Ring-billed Gull	*Larus delawarensis*		2	
California Gull	*Larus californicus*	●		SC
PIGEONS AND DOVES - COLUMBIDAE				
Rock Dove	*Columba livia*	●	1	
Band-tailed Pigeon	*Columba fasciata*	●		
Spotted Dove	*Streptopelia chinensis*	●	1	
Mourning Dove	*Zenaida macroura*	●	1,2,4	
CUCKOOS, ROADRUNNERS AND ANIS - CUCULIDAE				
Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*		2	CE
Greater Roadrunner	*Geococcyx californianus*	●	1,2	
BARN OWLS - TYTONIDAE				
Barn Owl	*Tyto alba*	●	2,4	
TYPICAL OWLS - STRIGIDAE				
Western Screech Owl	*Otus kennicottii*		2	
Great Horned Owl	*Bubo virginianus*	●	1,2	
Long-eared owl	*Asio otus*		5	SC
Spotted Owl	*Strix occidentalis*		5	FT,SC
Burrowing Owl	*Athene cunicularia*		3,5?	SC
GOATSUCKERS - CAPRIMULGIDAE				
Lesser Nighthawk	*Chordeiles acutipennis*	●		
Common Poorwill	*Phalaenoptilus nuttallii*		2	

SWIFTS - APODIDAE				
White-throated Swift	*Aeronautes saxatalis*	●	2,4	
Vaux's Swift	*Chaetura vauxi*		2	
HUMMINGBIRDS - TROCHILIDAE				
Violet-crowned Hummingbird	*Amazilia violiceps*			
Black-chinned Hummingbird	*Archilochus alexandri*		1,2,3,4	
Costa's Hummingbird	*Calypte costae*		1,4	
Anna's Hummingbird	*Calypte anna*	●	1,2,4	
Rufous Hummingbird	*Selasphorus rufus*	●		
Allen's Hummingbird	*Selasphorus sasin*		4	
KINGFISHERS - ALCEDINIDAE				
Belted Kingfisher	*Ceryle alcyon*	●	1,2	
WOODPECKERS AND ALLIES - PICIDAE				
Acorn Woodpecker	*Melanerpes formicivorus*		1,4	
Red-breasted Sapsucker	*Sphyrapicus ruber*	●	2	
Nuttall's Woodpecker	*Picoides nuttallii*	●	1,2,4	
Downy Woodpecker	*Picoides pubescens*	●	1,2	
Hairy Woodpecker	*Picoides villosus*	●	1	
Northern Flicker	*Colaptes auratus*	●	1,2,4	
TYRANT FLYCATCHERS - TYRANNIDAE				
Olive-sided Flycatcher	*Contopus borealis*		2	
Western Wood-Pewee	*Contopus sordidulus*	●	1,2,4	
Willow Flycatcher	*Empidonax traillii*	●	5	FT,CE
Hammond's Flycatcher	*Empidonax hammondi*	●		
Dusky Flycatcher	*Empidonax oberholseri*	●	1	
Pacific-slope Flycatcher	*Empidonax difficilis*	●	4	
Black Phoebe	*Sayornis nigricans*	●	1,2,4	
Say's Phoebe	*Sayornis saya*	●	2	
Ash-throated Flycatcher	*Myiarchus cinerascens*	●	1,2,4	
Cassin's Kingbird	*Tyrannus vociferans*	●	1,2	

Western Kingbird	*Tyrannus verticalis*	●	1,2,4	
LARKS - ALAUDIDAE				
Horned Lark	*Eremophila alpestris actia*	●	2	C2
SWALLOWS - HIRUNDINIDAE				
Tree Swallow	*Tachycineta bicolor*		3	
Violet-green Swallow	*Tachycineta thalassina*		1,2,3,4	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	●	1,2,4	
Cliff Swallow	*Hirundo pyrrhonota*	●	1,2	
Barn Swallow	*Hirundo rustica*	●	1	
JAYS, CROWS AND MAGPIES - CORVIDAE				
Stellar's Jay	*Cyanocitta stelleri*	●		
Scrub Jay	*Aphelocoma coerulescens*	●	1,2,4	
American Crow	*Corvus brachyrhynchos*	●	1,2	
Common Raven	*Corvus corax*	●	1,2,4	
TITMICE AND CHICKADEES - PARIDAE				
Mountain Chickadee	*Parus gambeli*			
Plain Titmouse	*Parus inornatus*	●	1,2,4	
BUSHTITS - AEGITHALIDAE				
Bushtit	*Psaltriparus minimus*	●	1,2,4	
NUTHATCHES - SITTIDAE				
Red-breasted Nuthatch	*Sitta canadensis*		1	
White-breasted Nuthatch	*Sitta carolinensis*	●		
WRENS - TROGLODYTIDAE				
Rock Wren	*Salpinctes obsoletus*	●	1	
Canyon Wren	*Catherpes mexicanus*			
Bewick's Wren	*Thryomanes bewickii*	●	1,2,4	
House Wren	*Troglodytes aedon*	●	1,2,4	
Marsh Wren	*Cistothorus palustris*	●		
THRUSHES - MUSCICAPIDAE				
Golden-crowned Kinglet	*Regulus satrapa*			

Ruby-crowned Kinglet	*Regulus calendula*	●	1,2,4	
Blue-gray Gnatcatcher	*Polioptila caerulea*	●	2	
Western Bluebird	*Sialia mexicana*	●	1,2,4	
Swainson's Thrush	*Catharus ustulatus*	●	1	
Hermit Thrush	*Catharus guttatus*	●	2,4	
American Robin	*Turdus migratorius*	●	1,4	
Wrentit	*Chamaea fasciata*	●	1,2,4	
MIMIC THRUSHES - MIMIDAE				
Northern Mockingbird	*Mimus polyglottos*	●	1,2	
California Thrasher	*Toxostoma redivivum*	●	1,2,4	
PIPITS AND WAGTAILS - MOTACILLIDAE				
American Pipit	*Anthus rubescens*	●	1,2	
WAXWINGS - BOMBYCILLIDAE				
Cedar Waxwing	*Bombycilla cedrorum*		2	
SILKY FLYCATCHERS - PTILOGONATIDAE				
Phainopepla	*Phainopepla nitens*	●	1,2,4	
SHRIKE - LANIIDAE				
Loggerhead Shrike	*Lanius ludovicianus*	●	1,2,5	C2
STARLINGS - STURNIDAE				
European Starling	*Sturnus vulgarus*	●	1,2,4	
VIREOS - VIREONIDAE				
Least Bell's Vireo	*Vireo bellii pusillus*		2,3,5	FE,CE
Solitary Vireo	*Vireo solitarius*		1	
Hutton's Vireo	*Vireo huttoni*		4	
Warbling Vireo	*Vireo gilvus*		1,2,4	
WARBLERS AND SPARROWS - EMBERIZIDAE				
Orange-crowned Warbler	*Vermivora celata*	●	1,2,4	
Nashville Warbler	*Vermivora ruficapilla*		1,2,4	
Yellow Warbler	*Dendroica petechia*	●	1,2,5	SC
Yellow-rumped Warbler	*Dendroica coronata*	●	1,2,4	

Black-throated Gray Warbler	*Dendroica nigrescens*	●	1,2,4	
Townsend's Warbler	*Dendroica townsendi*	●	2,4	
Hermit Warbler	*Dendroica occidentalis*		4	
Northern Waterthrush	*Seiurus noveboracensis*	●		
MacGillivray's Warbler	*Oporornis tolmiei*	●	1,2	
Common Yellowthroat	*Geothlypis trichas*	●	1,2	
Wilson's Warbler	*Wilsonia pusilla*	●	1,2,4	
Yellow-breasted Chat	*Icteria virens*		1,2,3,5	SC
Summer Tanager	*Piranga rubra*		5?	SC
Western Tanager	*Piranga ludoviciana*	●	1,2,4	
Black-headed Grosbeak	*Pheucticus melanocephalus*	●	1,2,4	
Blue Grosbeak	*Guiraca caerulea*	●	1	
Indigo Bunting	*Passerina cyanea*	●		
Lazuli Bunting	*Passerina amoena*	●	1,2,4	
Rufous-sided Towhee	*Pipilo erythrophthalmus*	●	1,2,4	
California Towhee	*Pipilo crissalis*	●	1,2,4	
Rufous-crowned Sparrow	*Aimophila ruficeps canescens*			C2,SC
Chipping Sparrow	*Spizella passerina*	●		
Brewer's Sparrow	*Spizella breweri*	●		
Vesper Sparrow	*Pooecetes gramineus*	●		
Lark Sparrow	*Chondestes grammacus*	●	1,2	
Sage Sparrow	*Amphispiza belli belli*	●	2,5	C2
Savannah Sparrow	*Passerculus sandwichensis*	●	4	
Grasshopper Sparrow	*Ammodramus savannarum*			
Fox Sparrow	*Passerella iliaca*	●		
Song Sparrow	*Melospiza melodia*	●	1	
Lincoln's Sparrow	*Melospiza lincolnii*	●	1,2	
Swamp Sparrow	*Melospiza georgiana*			
Golden-crowned Sparrow	*Zonotrichia atricapilla*	●	4	
White-crowned Sparrow	*Zonotrichia leucophrys*	●	1,2,4	

Dark-eyed Junco	*Junco hyemalis*	●	4	
Red-winged Blackbird	*Agelaius phoeniceus*	●	1,2	
Tricolored Blackbird	*Agelaius tricolor*	●	1	C2,SC
Western Meadowlark	*Sturnella neglecta*	●	2	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*		1	
Brewer's Blackbird	*Euphagus cyanocephalus*	●	1,2,4	
Great-tailed Grackle	*Quiscalus mexicanus*			
Brown-headed Cowbird	*Molothrus ater*	●	1,2	
Hooded Oriole	*Icterus cucullatus*		1,2,4	
Northern Oriole	*Icterus galbula*	●	1,2	
FINCHES - FRINGILLIDAE				
Purple Finch	*Carpodacus purpureus*		1	
House Finch	*Carpodacus mexicanus*	●	1,2,4	
Pine Siskin	*Carduelis pinus*		1	
Lesser Goldfinch	*Carduelis psaltria*	●	1,2,4	
Lawrence's Goldfinch	*Carduelis lawrencei*	●	1,2	
American Goldfinch	*Carduelis tristis*	●	1,2	
WEAVERS - PASSERIDAE				
House Sparrow	*Passer domesticus*	●	1	

Mammals of the Study Area

The following table lists all the species of mammals which are expected to occur within the study area and indicates whether the species was observed during SMEA surveys, whether the species has been documented on similar habitat adjacent to the study area and whether or not the species possesses a special conservation status. The taxonomy and use of common names primarily follows Jameson and Peeters (1988).

Species	Scientific Name	Sighted	Survey	Status
NEW WORLD OPPOSSUMS - DIDELPHIDAE				
Virginia Opossum	*Didelphis virginiana*		2,3	
SHREWS - SORICIDAE				
Ornate Shrew	*Sorex ornatus*		4	SC
Desert Shrew	*Notiosorex crawfordi*			
MOLES - TALPIDAE				
Broad-footed Mole	*Scapanus latimanus*		2	
LEAF NOSED BATS - PHYLLOSTOMIDAE				
California Leaf-nosed Bat	*Macrotus californicus*		5?	C2,SC
EVENING BATS - VESPERTILIONIDAE				
Pallid Bat	*Antrozous pallidus*		5	SC
Big Brown Bat	*Eptesicus fuscus*			
Red Bat	*Lasiurus borealis*			
Hoary Bat	*Lasiurus cinereus*			
California Myotis	*Myotis californicus*			
Long-eared Myotis	*Myotis evotis*			
Small-footed Myotis	*Myotis leibii*			
Little Brown Myotis	*Myotis lucifugus*			
Fringed Myotis	*Myotis thysanodes*			
Long-legged Myotis	*Myotis volans*			
Yuma Myotis	*Myotis yumanensis*			
Western Pipistrelle	*Pipistrellus hesperus*			
Townsend's Big-eared Bat	*Plecotus townsendii*		5?	C2,SC

House Mouse	*Mus musculus*		4	
WOLVES AND FOXES - CANIDAE				
Domestic Dog	*Canis familiaris*	●		
Coyote	*Canis latrans*	●	4	
Gray Fox	*Urocyon cinereoargenteus*			
RACCOONS AND ALLIES - PROCYONIDAE				
Ringtail	*Bassariscus astutus*			
Raccoon	*Procyon lotor*	○	2	
WEASELS, SKUNKS AND OTTERS - MUSTELIDAE				
Long-tailed Weasel	*Mustela frenata*		2	
American Badger	*Taxidea taxus*		2,5	SC
Western Spotted Skunk	*Spilogale gracilis*			
Striped Skunk	*Mephitis mephitis*	○	2,4	
CATS - FELIDAE				
Mountain Lion	*Felis concolor*		3	
Bobcat	*Felis rufus*	●	3	
Domestic Cat	*Felis catus*	●		
DEERS - CERVIDAE				
Mule Deer	*Odocoileus hemionus*	●	2,4	

[1] The question mark indicates that it was not ascertained which *Perognathus* species occurs on the study site and that Weintraub and Hanes (1991) had the same difficulty. In both SMEA's work and the survey conducted by Weintraub and Hanes (1991), *Perognathus* scat was observed, as indicated by the open circle; however in neither case were individuals seen so that specific level identification is lacking.

Sensitive Biota Potentially Found in the Study Area

Species actually located during SMEA surveys are marked with a ★.

Plants.

★ Nevin's Brickellbush (*Brickellia nevinii*).

This species has no special conservation status. Nevin's brickellbush is an uncommon element of desert scrub communitiies. It is included here because it is an uncommon (Hickman 1993) plant and because the study site is north of its normal range.

Santa Susana Tarweed (*Hemizonia minthornii*).

The Santa Susana tarweed is a federal Category 2 Candidate species. The species is endemic to California. The tarweed is largely confined to rocky outcroppings in the Santa Susana mountains. This species was not found in the study area.

Lyon's Pentachaeta (*Pentachaeta lyonii*).

Lyon's pentachaeta is listed as a California endangered species. This species is typically associated with valley grasslands at an altitude of less than 150 meters. It is recorded from coastal Los Angeles County and was considered to possibly occur within the study area. No evidence of this species was found within the study area.

Nevin's Barberry (*Mahonia nevinii*).

Nevin's barberry is a federal Category 1 Candidate species and is listed as endangered by CDFG. The species occurs in sandy and gravelly places below 2000 feet in coastal sage scrub and chaparral. The closest known occurrence is in San Francisquito Canyon near DWP's powerhouse #2. The species is conspicuous and would have been noted during surveys if it was present in the study area.

★ Short-joint Beavertail Cactus (*Opuntia basilaris* var. *brachyclada*).

The short-joint beavertail cactus is a federal Category 2 Candidate species. This species is found along the desert slopes of the San Gabriel and San Bernadino mountains, in the Vulcan mountains of San Diego County, and in the Providence mountains of the eastern Mojave desert. This species always occurs with the more common var. *basilaris*. The short-joint beavertail cactus occurs in the study area, particularly the southeast portion.

★ **Peirson's Morning-glory** (*Calystegia peirsonii*).

Peirson's morning-glory is a federal Category 2 Candidate species. This species was originally considered to be endangered, however, it was discovered to be common in the Santa Clarita area. The California Native Plant Society downgraded its listing of this species in 1984. Many records are known from the Mint Canyon/Saugus/Santa Clarita area in coastal sage scrub with sandy-clayey substrates. It is expected and has been observed in mature terraces along the Santa Clara River and San Francisquito Creek.

Davidson's Bush Mallow (*Malacothamnus davidsonii*).

This species has no federal or state special conservation status but is listed by the California Native Plant Society as 1B, indicating that they consider the plant rare or endangered in California. According to Hickman (1993) this species intergrades with *M. fasciculatus*. Although the latter does occur in the study area, no individuals were located that could be attributed to *M. davidsonii*.

★ **Navarretia** (*Navarretia fossalis*).

This species has no special conservation status, but is included here because it is a rare plant (Hickman 1993) and because it is a vernal pool associate species. This species was only found in association with the vernal pools on Cruzon Mesa.

San Fernando Valley Spineflower (*Chorizanthe parryi* var. *fernandina*).

The San Fernando Valley spineflower is a federal Category 1 Candidate species and the California Native Plant Society has listed the species in their 1A category, presumed extinct in California. The Jepson Manual (Hickman 1993) lists the species as presumed extinct. The spineflower was collected near Newhall in 1893 and near Castaic in 1929 (the last known collection of this species). There is no evidence that this species occurs within the study area, although it historically occurred here.

Slender-horned Spineflower (*Dodecahema leptoceras*).

The slender-horned spineflower is listed as a federal and state endangered species. The species is known from widely scattered localities in southern California. It was collected in 1893 at Newhall, in 1937 in Mint Canyon and most recently near the mouth of Soledad Canyon where Bee Canyon drains under Soledad Canyon Road (Henrickson 1993). The Bee Canyon specimens are the only recently collected specimens from this area. Prigge *et al.* (1993) analyzed all instances of known collections of this species and concluded that the

spineflower occurs in alluvial scrub vegetation on 100/200 year flood terraces or sandy benches. Thus it would not be expected on the active floodplain and will not be expected in dense cottonwood/willow areas that shade the understory. Despite the attempts of many botanists no specimens have been located in this area except for the aforementioned Bee Canyon specimens, despite the presence of apparently appropriate habitat and appropriate associated species.

★ **California Orcutt Grass** (*Orcuttia californica*).

California orcutt grass is listed as a California endangered species. The species was previously recorded form vernal pools at altitudes of less than 625 meters. The range of this species according to Hickman (1993) is southwest Los Angeles, Riverside and San Diego Counties. This species is a vernal pool obligate species. No vernal pools were known from northern Los Angeles County until this survey. Orcutt grass is found in the vernal pools on Cruzon Mesa.

Butterflies.

★ **San Emigdio Blue** (*Plebejus emigdionis*).

The San Emigdio blue is a federal Category 2 Candidate species. This species was once believed to have been extirpated form the Santa Clara River valley. The species requires a specific foodplant, *Atriplex canescens*, and appears to also require a symbiotic ant species, *Formica pilicornis*, with which it is specifically associated (Ballmer and Pratt 1992). Both the ant species and the foodplant were found at most habitats surveyed, but the species was only found at two localities along Oak Spring Canyon. The pattern of distribution and abundance of this butterfly is not well understood. There are many apparently satisfactory foodplant sites but the species is found at only a very few of these sites. The butterfly was common ten years ago along the Santa Clara River (Mattoni, pers comm).

Fishes.

★ **Arroyo Chub** (*Gila orcutti*).

The arroyo chub is a CDFG Species of Special Concern. The arroyo chub is found in the slow water sections of streams with mud and sand substrates (Moyle 1989). The chub is presently absent or reduced throughout most of its native range (Moyle 1989; Haglund unpubl. data). However, it has been successfully introduced into other streams in southern California. The Santa Clara River population is believed to be an introduced population (e.g. Swift *et al* 1993). Arroyo chubs are omnivorous, feeding on algae, insects, and small crustaceans. Laboratory studies indicate that the chub is physiologically adapted to survive hypoxic conditions and wide temperature fluctuations common to desert streams. Chubs occur in the Santa Clara River throughout the study area wherever there is regular surface water. At the time of the fish surveys, chubs were found from the western boundary of the study area upstream to Bouquet Canyon bridge and from Sierra Highway bridge upstream to the eastern boundary of the study area. Chubs are also found in the Santa Clara River immediately upstream and downstream of the study area.

★ **Santa Ana Sucker** (*Catostomus santaanae*).

The Santa Ana sucker is a Category 2 Candidate species and a CDFG Species of Special Concern. A petition to list this species has been submitted to the USFWS and their response is due in September of 1995. Santa Ana suckers are endemic to southern California and maybe the Los Angeles basin. Miller (1968) and Greenfield *et al* (1970) suggest that the Santa Clara River population may have been derived from a relatively recent introduction. Within its native range the sucker has been extirpated or is greatly reduced except in the upper San Gabriel River (Haglund and Baskin unpubl. data). Santa Ana suckers are found in small to medium sized streams with slight to swift current. The species feeds primarily on detritus, algae, and diatoms; aquatic insect larvae, fish scales, and fish eggs constitute minor dietary elements, although larger fish appear to consume greater amounts of insect larvae. A petition to officially list this species has been submitted to the USFWS. Suckers occur in the Santa Clara River throughout the study area wherever there is regular surface water. At the time of the fish surveys, suckers were found from the western boundary of the study area upstream to Bouquet Canyon bridge and from Sierra Highway bridge upstream to the eastern boundary of the study area. Suckers are also found in the Santa Clara River immediately upstream and downstream of the study area.

★ **Unarmored Threespine Stickleback** (*Gasterosteus aculeatus williamsoni*).

The unarmored threespine stickleback is a Federally Endangered and State Endangered species. Originally found in the three streams of the Los Angeles basin in addition to the Santa Clara River, it has been extirpated everywhere outside of the Santa

Clara River. Sticklebacks prefer quiet water habitats such as pools with abundant vegetation, backwaters and stream margins where the water velocity is low (Haglund and Buth unpubl. data). They feed primarily on benthic invertebrates and organisms found on the surfaces of aquatic vegetation. Sticklebacks occur in the Santa Clara River throughout the study area wherever there is regular surface water. At the time of the fish surveys, sticklebacks were found from the western boundary of the study area upstream to Bouquet Canyon bridge and from Sierra Highway bridge upstream to the eastern boundary of the study area. Sticklebacks are also found in the Santa Clara River immediately upstream and downstream of the study area.

Amphibians.

Coast Range Newt (*Taricha torosa torosa*).

The coast range newt is a CDFG Species of Special Concern. The newt breeds in ponds, reservoirs, and slowly flowing streams. It goes to water at the first rains and breeds December to May. Although this species was considered to be potentially present in the study area, there is a complete lack of evidence that this species occurs in the study area.

★ **Western Spadefoot** (*Scaphiopus hammondii*).

The western spadefoot, a CDFG Species of Special Concern, historically occurred in vernal pools throughout lowland southern California. Today, nearly all of the recorded western spadefoot population locations in the region have been converted to agricultural, residential, or commercial developments. Only a few populations are known to persist in isolated, widely scattered areas. The western spadefoot was found on the Cruzon Mesa and along the Santa Clara River upstream of Highway 14 and upstream of Sand Canyon. Relatively large populations occur along the Santa Clara River but only a couple individuals were found on Cruzon Mesa. However this species is associated with the vernal pools on Cruzon Mesa, and because the pools did not fill during the 1993/1994 wet season an accurate estimate of their population was not possible.

Arroyo Southwestern Toad (*Bufo microscaphus californicus*).

The arroyo southwestern toad was a federal Category 1 candidate and a CDFG Species of Special Concern at the time of the SMEA surveys. This toad is being considered for elevation to species status as *Bufo californicus*, and was listed as an endangered species by the USFWS. The arroyo southwestern toad occurs sporadically in the region in gently sloping washes, streams, and arroyos, especially those with sandy banks supporting willows, cottonwoods and sycamores, and in alluvial habitat at the mouths of canyons (Stewart 1990). Habitat loss has probably been the greatest factor contributing to the extensive reduction of arroyo toad populations in northern Los Angeles County. Other factors in the reduction may include water quality reduction and the introduction of the bullfrog (*Rana catesbeiana*) and non-native game fishes. No specimens of this species were located during surveys but small numbers of individuals may still be present in the study area in areas of perennial water.

California Red-legged Frog (*Rana aurora draytonii*).

The California red-legged frog is a CDFG Species of Special Concern. This southern populations of this species, like all ranids, have declined precipitously in the last two decades. This species is believed to have been extirpated from the Santa Clara River valley

as it has not been recorded from the Santa Clara River since the 1970s. The species was once common in the lowlands and foothills. It frequents marshes, streams, lakes, reservoirs, ponds, and other usually permanent sources of water. The red-legged frog prefers areas where cattails or other plants provide good cover (Stebbins 1985). This frog feeds on a variety of foods. It readily eats fish, but will also eat insects, tadpoles, and small frogs. This species is one of the most cannibalistic of North American frogs (Dickerson, 1969). This species no longer occurs in the study area.

Reptiles.

Southwestern Pond Turtle (*Clemmys marmorata pallida*).

The southwestern pond turtle is a federal Category 2 Candidate species and a CDFG Species of Special Concern. The species has precipitously declined; of the 87 known southern California populations in 1960 only 20 remained in 1987 (Brattstrom and Messer 1988). This species is the most aquatic turtle in the genus *Clemmys*. Habitat requirements generally consist of long deep pools with plenty of cover both above and below the water. Basking sites adjacent to deep water for escape and large enough to allow the turtle to fully emerge from the water are also required (Bury 1972). Suitably well protected terrestrial sites for egg laying and winter dormancy must also be present. No turtles were located in the study area but there are anecdotal records from Placerita Canyon and a population of turtles exists in the Santa Clara River just downstream of the study area.

★ **California Horned Lizard** (*Phrynosoma coronatum frontale*).

The California horned lizard is a CDFG Species of Special Concern. The study area is near the southern end of the distribution of this lizard. If it occurs in the study area, it will likely be as an intergrade area with the San Diego horned lizard. For further discussion see the discussion of the San Diego horned lizard below.

★ **San Diego Horned Lizard** (*Phrynosoma coronatum blainvillei*).

The San Diego horned lizard is a USFWS Category 2 Candidate and a CDFG Species of Special Concern. It was formerly common throughout Southern California west of the deserts, but has declined dramatically over the last century as suitable habitat has been destroyed by development and urbanization, and as a result of over-collecting for the pet trade (McGurty 1980; Stebbins 1985; Stewart 1990). The horned lizard is found in open, sandy areas and washes within chaparral and coastal sage scrub habitat. It is associated with areas where its preferred prey, harvester ants of the genera *Pogonomyrmex* and/or *Messor*, can be obtained and is often located by first identifying harvester ant colonies. Fecal pellets which may belong to this species/subspecies were observed in Plum Canyon. The scat however could belong to either subspecies (*P. c. blainvillei* or *P. c. frontale*). It is possible, even likely that northern Los Angeles County is an intergrade zone between the two subspecies. However, in such cases, the resource agencies typically consider the sensitivity status of the population to be that of the more sensitive of the subspecies.

★ **Coastal Whiptail** (*Cnemidophorus tigris multiscutatus*).

The coastal whiptail is a federal Category 2 Candidate species and a CDFG Species of

Special Concern. This lizard, like much of the southern California fauna, has declined as habitat has been destroyed by agriculture and urbanization. This is an active lizard of deserts and semiarid habitats, usually where plants are sparse and there are open areas for running. The coastal whiptail is also found in streamside growth. It eats insects, spiders, scorpions, and lizards. Whiptails are fairly widespread in the study area, they were observed in Plum Canyon, Sand Canyon, along the Santa Clara River in the eastern portion of the study area and they also have been reported from Placerita Canyon.

Silvery Legless Lizard (*Anniella pulchra pulchra*).

The silvery legless lizard is a CDFG Species of Special Concern. Habitat destruction appears to be the primary cause for the decline of this small, unobtrusive species. It needs loose soil for burrowing (sand, loam, or humus), moisture, warmth, and plant cover (Stebbins 1985). The species is found in the sparse vegetation of beaches, chaparral, pine-oak woodlands, and in streamside growth of sycamores, cottonwoods, and oaks (Stebbins 1985). It burrows in washes, dune sand of beaches, and loose soil near the bases of slopes and near permanent and temporary streams. It forages for insects and spiders in leaf litter by day. Although not discovered during the reptile surveys, this species probably does occur in the study area. Appropriate habitat is present in the study area.

San Bernadino Ringneck Snake (*Diadophis punctatus modestus*).

The San Bernadino ringneck snake is a federal Category 2 Candidate species. This is a snake of moist environments, including woodland, grassland, chaparral, farms and gardens; seldom seen in the open, usually found on the ground under bark, beneath and within rotting logs, and under stones or boards. Although no individuals were found during our survey it is probable that this species occurs in the study area. Documenting the presence of uncommon snakes is always difficult.

Coast Patch-nosed Snake (*Salvadora hexalepis virgultea*).

The coast patch-nosed snake is a federal Category 2 Candidate species and a CDFG Species of Special Concern. The patch-nosed snake is an active diurnal resident of desert scrub, grasslands, sagebrush, chaparral, and rocky washes and streams. Lizards and mice are the principal items in the patch-nosed snake diet but it will also eat snake and lizard eggs when possible. Chiefly a ground dwelling snake, it will occasionally climb vegetation. Although no individuals were found during our survey it is possible that this species occurs in the study area. Documenting the presence of uncommon snakes is always difficult.

San Diego Mountain Kingsnake (*Lampropeltis zonata pulchra*).

The San Diego mountain kingsnake is a CDFG Species of Special Concern. It is a snake of moist woods - coniferous forest, woodland, and chaparral; ranging from sea level to high into the mountains. Mountain kingsnakes are commonly found in the vicinity of well-lit rocky streams in wooded areas where there are rotting logs. The species is primarily diurnal but will be active nocturnally in warm weather. The snakes eat lizards, snakes, bird eggs and nestlings, and small mammals (Stebbins 1985). Although no individuals were found during our survey it is possible that this species occurs in the study area. Documenting the presence of uncommon snakes is always difficult.

California Red-sided Garter Snake (*Thamnophis sirtalis infernalis*).

The California red-sided garter snake is a CDFG Species of Special Concern. This species is found in many environments - grasslands, woodland, scrub and chaparral. Tends to be found near water. Populations have been reduced due to development and agricultural use of habitats that previously flanked riparian habitat. This type of habitat destruction was believed to have extirpated the red-sided garter snake in the Santa Clara River valley, however, there is a recent anecdotal record of its rediscovery in 1991. It is unlikely that this species occurs in the study area.

★ **Hammond Two-striped Garter Snake** (*Thamnophis hammondii hammondii*).

The two-striped garter snake is a federal Category 2 Candidate species and a CDFG Species of Special Concern. This snake is found in or near permanent freshwater, often along streams with rocky beds, bordered by willows or with other streamside growth. Most active at dusk or at night, but it may be encountered in water in the daytime. Highly aquatic, during its summer activity period it may only rarely leave the water. Adults eat tadpoles, toads, frogs, fish, fish eggs, and earthworms. Two-striped garter snakes occur between the western boundary of the study area and McBean Parkway bridge, they may also occur in Placerita Canyon. The garter snake is also found downstream of the study area in the Santa Clara River.

Birds.

American White Pelican (*Pelecanus erythrorhynchos*).

The white pelican is a CDFG Species of Special Concern. It is a fairly common to occasionally abundant spring and fall transient. Declines in this species were initially as a result of the bioaccumulation of pesticide residues and later the disruption of their wintering sites. Wintering sites in southern California are the larger lakes/reservoirs. This species is regularly seen on Castaic Lake. Migrant flocks (mainly March-April and September-October) are regularly seen along the southern flank of the San Gabriel Mountains, so it undoubtedly flies over on occasion, but does not utilize the study area.

Double-crested Cormorant (*Phalacrocorax auritus*).

The double-crested cormorant is a CDFG Species of Special Concern. The species suffered a population decline during the 1960s and early 1970s due to the bioaccumulation of DDT residues in marine food chains. There was some recovery in the late 1970s and 1980s, but the original population levels never recovered. The El Nino years of the early 1980s may have also contributed to their decline (Small 1994). This is the only cormorant to regularly occur in freshwater in California. It is undoubtedly an occasional visitor to ponds in the study area and is an overhead migrant, but it was not seen during SMEA surveys.

California Condor (*Gymnogyps californianus*).

The California condor is a Federally Endangered and State Endangered species. The last wild condor was placed in captivity in 1987. Recently, captive bred young have been released into the wild. Condors forage widely covering 40-125 miles per day over open grassland and savannah. Individuals released into the wild can be expected to fly over the study area while foraging.

★ **Osprey** (*Pandion haliaetus*).

The osprey is a CDFG Species of Special Concern. The osprey was formerly more common and widespread. Its decline was presumably due to pesticide bioaccumulation and habitat destruction. In southern California ospreys occur most frequently as uncommon spring and fall transients and winter visitors, but may be encountered throughout the year as occasional birds take up residence at favorable localities (Small 1994). It is a migrant and winter visitor around water, mainly outside the study area (e.g. Castaic Lake). During SMEA surveys an osprey was observed once along the Santa Clara River downstream of McBean Parkway and another was observed flying past Cruzon Mesa.

★ **White-tailed Kite** (*Elanus leucurus*).

The white-tailed kite is a Fully Protected Species in California; a designation given prior to the enactment of the Endangered Species Act. Populations had declined to very low levels earlier in the century but the species has recovered slightly in the last 20 years. Numbers have levelled off recently but there were several population fluctuations since the mid-1970s. The instability of population size is often used to suggest that the population sizes of kites has not returned to "normal" since the decline earlier in the century. The white-tailed kite feeds primarily on microtine rodents and large insects which it hunts by hovering over suitable habitat. It forages over open grassland, and nests in trees in a variety of habitats, but winter roosts usually occur in trees rooted in marshlands. From one to three pairs breed along the Santa Clara River within one mile upstream and downstream of Interstate 5. The species was also observed at Cruzon Mesa and there may be additional pairs within the study areas.

★ **Northern Harrier** (*Circus cyaneus*).

The northern harrier is a CDFG Species of Special Concern. This species was once a widespread nesting species. It has almost been eliminated as a nesting species in southern California because of the destruction of appropriate habitat (Small 1994). The harrier is a migrant and winter visitant to open grasslands and marshes. Individuals were regularly seen at Cruzon Mesa. The nearest known regular nesting area is at Piaute Ponds near Lancaster in the Antelope Valley, but nesting in the Santa Clara River valley is a possibility.

★ **Sharp-shinned Hawk** (*Accipiter striatus*).

The sharp-shinned hawk is a CDFG Species of Special Concern. This species is a uncommon to fairly common transient and winter visitor. They prefer broken woodlands for breeding habitat. Confirmed nestings are rare. It is a migrant and winter visitant to all habitats in the study area. As there is a significant passage of migrants of this species along the south flank of the San Gabriel Mountains, it is possible that the Santa Clarita area is an important funneling point for migrants of this and other raptor species.

★ **Cooper's Hawk** (*Accipiter cooperi*).

The cooper's hawk is a CDFG Species of Special Concern. This species was once fairly common in southern California, but has declined dramatically in recent years. The decline is result of the loss of suitable nesting habitat to development. The hawk is a woodland species that nests in riparian woodlands, where it feeds on small birds, reptiles, and mammals. This species probably occurs more widely during the winter and during migration. It probably breeds west of McBean Parkway where it was regularly seen,

including during our surveys, and is likely to breed in the Placerita Canyon area.

★ **Golden Eagle** (*Aquila chrysaetos*).

The golden eagle is a CDFG Species of Special Concern and a California Fully Protected Species, this species is also protected under the Bald and Golden Eagle Protection Act. An uncommon resident, this species nests on cliffs and less commonly in medium to tall trees in open woodland bordering open country for foraging and scavenging. Golden eagles maintain large home ranges up to 35 square miles. Suitable nesting sites are probably rare or lacking in the study area but it will be seen occasionally while foraging, as during the SMEA surveys.

Merlin (*Falco columbarius*).

The merlin is a CDFG Species of Special Concern. This species is a rare to very uncommon spring and fall transient and winter visitor. This falcon tends to remain in the lowlands. It is probably a scarce winter visitant to the more wooded portions of the study area, but was not located during the SMEA surveys.

Prairie Falcon (*Falco mexicanus*).

The prairie falcon is a CDFG Species of Special Concern and a California Fully Protected Species. Prairie falcons inhabit dry open country and prey primarily on birds which they capture in flight. The falcon also will prey upon rodents, lizards and large insects. This species requires cliffs and rocky outcrops for nesting as well as dry open areas for foraging. It is probably an uncommon non-breeding visitor to the more open areas of the study area. Prairie falcons have been observed over the open agricultural fields at Castaic Junction and over the Santa Clara River upstream of Interstate 5 by SMEA personnel and others prior to this study.

American Peregrine Falcon (*Falco peregrinus anatum*).

The American peregrine falcon is a Federally Endangered Species, a California Fully Protected Species, and a California Endangered Species. From a breeding population of 100-300 pairs in California prior to the 1940s (Cade *et al* 1988) the breeding population declined catastrophically during the 1950s and 1960s so that there were only two known nesting pairs in 1970. The decline has been attributed primarily to the bioaccumulation of chlorinated hydrocarbons ingested with their prey (Small 1994). The reintroduction of captive propagated peregrine falcons has been successful and contributed significantly to the present increase in the California breeding population. This species was been observed over

agricultural fields immediately to the west of the study area around Castaic Junction and over the open fields north of the Santa Clara River between San Francisquito Canyon and McBean Parkway by SMEA personnel and others prior to this study.

★ **California Gull** (*Larus californicus*).

The California gull is a CDFG Species of Special Concern. This species achieved a special conservation status largely because the lowering of Mono Lake resulted in the decimation of the largest breeding colony. The California gull is a common winter visitor in the general area, usually seen in flight overhead. It forages at landfills, and around school yards and shopping centers where trash accumulates. They roost on Castaic Reservoir and Los Angeles Reservoir just outside of the study area. They were observed in the study area during SMEA surveys.

Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*).

The yellow-billed cuckoo is a California Endangered Species. This species has declined since the turn of the century when there were an estimated 70,000 breeding pairs (California Nature Conservancy 1989, cited in Small 1994). The decline is attributable to the widespread destruction of riparian forests/habitats, bioaccumulation of DDT during the 1970s, and there are concerns about the status the wintering habitat (Small 1994). Presently there are believed to be 50-75 breeding pairs and no more than 300 total individuals in the state. Cuckoos require an average of 17 hectares per pair for foraging and nesting. Foraging occurs mainly in the cottonwood canopy and the nests are placed almost entirely in willows (Layton and Halterman 1987). It was not observed during the present study, but could potentially occur in cottonwood/willow growth along the Santa Clara River downstream of McBean Parkway, although there are no records of such an occurance. There are a few recent records in the Santa Clara River drainage but most were presumably transients and the sightings are primarily to the west of the study site.

Long-eared Owl (*Asio otus*).

The long-eared owl is a CDFG Species of Special Concern. This owl has declined as a breeding species in California, the major factor probably being the destruction and degradation of necessary nesting and roosting habitats (Small 1994). For nesting and roosting they require dense stands of trees adjacent to open country which is used for hunting small mammals. A roost was present in an old olive orchard in Plum Canyon during the winter of 1992-1993 (Garrett, pers comm). The roost was unoccupied during the present study.

Spotted Owl (*Strix occidentalis*).

The spotted owl is a Federally Threatened species and a California Species of Special Concern. The owl is an uncommon permanent resident in thickly wooded canyons of the coastal ranges in southern California, inhabiting forests dominated by canyon live oak. Out-of-habitat owls can be found in riparian forests, oak savannahs and even suburban areas (Small 1994). Probably a rare resident in wooded canyons just above the extreme southeastern corner of the study area, above Placerita Canyon. Surveys by the U.S. Forest Service and U.S. Fish and Wildlife Service have identified territories of this species in some of the canyons in the westernmost San Gabriel Mountains.

Burrowing Owl (*Athene cunicularia*).

The burrowing owl is a CDFG Species of Special Concern. The decline of this species was recognized as early as the 1940s. The decline is attributable to the conversion of grasslands and pasturelands to agriculture and to the destruction of ground squirrel colonies by plowing and poisoning. The burrowing owl is unique because it lives in the abandoned burrows of ground squirrels. They modify the burrows to suit there needs by digging. It is one of the few diurnal owls and can be seen in the day perched on fenceposts or near the entrance to their burrow. They are limited by the lack of suitable dirt embankments with ground squirrel activity that are not regularly disturbed by vehicles or road maintenance crews. None were seen during the SMEA surveys but this species has recently been observed on the grassy understory areas in valley oak woodlands near College of the Canyons, which is within the study area.

★ **Willow Flycatcher** (*Epidonax traillii*).

The willow flycatcher is a state-listed endangered species. Grinnell and Miller (1944) considered this species common and widely distributed in California. The coastal region of southern California was a center of breeding abundance. As is the case with many riparian species, the loss of habitat has been a contributing factor in the species' decline. However, there is also evidence that nest parasitism by brown-headed cowbirds is a major factor in the species' decline. The decline of this species is among the most serious of any bird in the region. The willow flycatcher nests in dense willow stands 3-8 feet in height, within willow riparian habitat, often in canyons or along floodplains. It forages for insects within riparian habitats. Migrant individuals utilize the same habitat as resident birds. Unitt (1987) considers all the breeding willow flycatchers in southern California to be the extremely endangered *extimus*, whose total breeding population in California is fewer than 90 pairs. Willow flycatchers are fairly common spring (May and early June) and fall (August through September) transient in riparian areas. The southwestern subspecies *extimus* formerly bred in the Santa Clara River drainage, but apparently no longer does so. Singing birds have been noted along the Santa Clara River upstream from Interstate 5 as late as mid-June (Garrett,

pers comm), but the species is a very late spring migrant. Such records cannot be considered breeding birds without additional evidence. A fall migrant was observed along the Santa Clara River at Bouquet Canyon by SMEA.

★ **Horned Lark** (*Eremophila alpestris actia*).

The horned lark is a federal Category 2 Candidate species. Horned larks occupy a wide variety of habitats, but are believed to be declining due to habitat loss. In southern California they are locally fairly common coastal breeders where habitat still remains. Probably an uncommon resident, with numbers augmented in winter by birds from migratory populations. Larks breeding in this area are almost certainly of the coastal slope subspecies *actia*. Small flocks are seen regularly in summer within the Santa Clara River floodplain around Castaic Junction. A singing bird was found March 1994 over fields adjacent to the Santa Clara River at McBean Parkway. The species was observed in winter on Cruzon Mesa, but there is no documented breeding on the mesa although the habitat is suitable.

★ **Loggerhead Shrike** (*Lanius ludovicianus*).

The loggerhead shrike is a federal Category 2 Candidate species. The loggerhead shrike appears to be declining (Small 1994). In general they prefer open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. These requirements are met by broken woodlands, savannahs, riparian woodlands, desert scrub, and even sparsely populated suburbs. The shrike is an uncommon winter visitant, but small numbers probably breed in the study area as breeding pairs are found both upstream and downstream of the study area within the Santa Clara River drainage. The species was observed during this study on Cruzon mesa, in Plum Canyon, along the Santa Clara River bottom upstream of Interstate 5, and south of the Santa Clara River at Lost Canyon.

Least Bell's Vireo (*Vireo bellii pusillus*).

The least Bell's vireo is a USFWS and CDFG endangered species. This species, represented by the *pusillus* subspecies, was once common in riparian habitats from the Central Valley south, but it has been extirpated north of the Transverse Ranges. The vireo is presently limited to a few riparian habitats from Los Angeles to San Diego County. The decline of the least Bell's vireo populations can be attributed to the destruction of riparian habitat and nest parasitism by the brown-headed cowbird. The vireo nests in willow riparian habitat with a dense understory of young willows, wild rose, or other native plants; preferably where flowing water is present. It is usually found where the riparian habitat is bordered by another native plant community. The birds nest low in the willows and the conspicuous nature of their nests make them susceptible to nest parasitism and other forms of depredation including predation and disturbance by cattle grazing. This endangered bird was

not observed in the study area during the present fieldwork, but it must be considered a potential breeder in the riparian habitat along the Santa Clara River between Interstate 5 and McBean Parkway. A transient individual was seen at the western edge of the study area along the Santa Clara River in 1991 (Haglund, field notes) and has been observed along the Santa Clara River downstream of Interstate 5 in 1986, 1988, and 1991 (various, see page 39).

★ **Yellow Warbler** (*Dendroica petechia*).

The yellow warbler is a CDFG Species of Special Concern. This species was once a locally abundant summer resident throughout California. The breeding population began to decline in the 1930s but the rate of decline has increased since the 1950s (Small 1994). Habitat destruction and cowbird nest parasitism are the cause of the reduced the yellow warbler populations. Yellow warblers nest in willow, cottonwood, and alder riparian habitats and forage for insects in the riparian habitat. Common spring and fall transient throughout the study area, especially in riparian areas. Nineteen individuals were observed along the Santa Clara River upstream of Interstate 5 on 25 September 1993. Yellow warblers breed in cottonwood-willow riparian habitats along the Santa Clara River and its tributaries (e.g. San Francisquito Canyon, Bouquet Canyon, Placerita Canyon). This species is probably not common as a breeding species; only 1-2 singing birds were noted between McBean Parkway and Interstate 5 on 30 May 1993.

Yellow-breasted Chat (*Icteria virens*).

The yellow-breasted chat is a CDFG Species of Special Concern. It was formerly a common nesting bird in riparian habitats throughout California. Like all riparian nesting birds, chat populations have declined as a result of habitat destruction and nest parasitism by brown-headed cowbirds. Populations have declined most significantly in southern California. It is now a rare and local breeding species and has been extirpated in much of its former range. Chats nest in dense riparian thickets of willows and brushy areas in the vicinity of lowland watercourses where it feeds on insects. This species is inconspicuous except when vocalizing. It particularly favors the borders between river bottom riparian habitat and uplands, where there are dense tangles of blackberries, wild grapes, etc. Such tangles are scarce in the Santa Clara river bottom largely due the fact that there has been development or agriculture right up to the edge of the cottonwood-willow habitat. Chats were not observed during the present study, although in the recent past it was a rare breeding summer resident along the Santa Clara River both upstream and downstream from Interstate 5 and chats have been heard west of the study area in 1992 (Haglund, field notes).

Summer Tanager (*Piranga rubra*).

The summer tanager is a CDFG Species of Special Concern. Tanagers have declined as riparian habitat has been destroyed. Breeding birds require riparian woodlands in river or stream bottoms with extensive dense stands of tall cottonwoods and a fairly dense understory of willows, although the tanagers forage and breed in the cottonwoods (Small 1994). Breeding birds belong to the *cooperi* subspecies; however, the eastern *rubra* subspecies is a rare but regular transient. This species was not observed during the present study. However, a singing male was observed along the Santa Clara River on 2 June 1990 downstream of McBean Parkway and records of this species from the previous years in this same area suggest the species did breed here. There is also a recent Los Angeles County Museum specimen from Haskell Canyon, and it is the expected local breeding subspecies, *cooperi*. The Santa Clarita area is the western most breeding locality for this species.

Rufous-crowned Sparrow (*Aimophila ruficeps canescens*).

The rufous-crowned sparrow is a CDFG Species of Special Concern. This species is is a locally uncommon to fairly common resident (Small 1994). It prefers more arid, sunny slopes with rock outcropping, which are vegetated with grasses and widely spaced low shrubs. The sparrow was not observed during the present study. Suitable habitat appears to exist on the borders of Cruzon Mesa, in Plum Canyon, and on the slopes bordering San Francisquito, Haskell, and Bouquet Canyons. The species has been observed in fair numbers in San Francisquito Canyon north of the study area.

★ **Sage Sparrow** (*Amphispiza belli belli*).

The sage sparrow is a CDFG Species of Special Concern. "Bell's" sparrow is an uncommon to locally fairly common resident. This sparrow is a characteristic breeding bird of the interior chaparral dominated by fairly dense stands of chamise, *Adenostoma fasciculatum*, but is also found in the coastal sage scrub associated with *Artemisia californica* in the more southerly portion of its range. A pair was observed on the northeast flank of Cruzon Mesa on 27 March 1994. These birds were of the dark coastal slope subspecies *belli*; birds of the paler interior nesting races *canescens* and *nevadensis* may occur as scarce transients or winter visitants.

★ **Tricolored Blackbird** (*Agelaius tricolor*).

The tricolored blackbird is a federal Category 2 Candidate species and a CDFG Species of Special Concern. This species is a locally common resident, whose population is rather fluid from year to year and season to season, but its population appears to have seriously declined in recent years (Small 1994). For breeding this blackbird prefers

freshwater marshes with dense stands of cattails and/or bullrushes, and occasionally willows and other dense shrubs (Neff 1937). They forage over agricultural land in close proximity to the breeding marsh. No known breeding colonies occur within the study area. About 15 birds were observed in the study area in planted trees in the parking lot of a commercial center at the corner of Valencia and Bouquet Canyon Roads. The birds were seen in early spring 1994, suggesting that there might be breeding areas nearby.

Mammals.

Ornate Shrew (*Sorex ornatus*).

The ornate shrew is a CDFG Species of Special Concern. The species is widespread in California but some of the subspecies are severely threatened or endangered. Southern California populations have declined primarily in response to habitat destruction. The distinctive life cycle of the shrew makes it particularly susceptible to disturbance. In many species there is but a single litter. Shortly after the young are weaned, the adults die, so that by midsummer almost the entire population consists of young born during the previous few weeks (Jameson and Peeters 1988). Ornate shrews typically occupy rather open areas where they feed on small soil dwelling insects. This shrew is possibly present within the study area, but much of the area is highly disturbed so that the species is not likely to be abundant if present.

California Leaf-nosed Bat (*Macrotus californicus*).

The California leaf-nosed bat is a federal Category 2 Candidate species and a CDFG Species of Special Concern. Leaf-nosed bats roost primarily in caves and old mines and occasionally in buildings. This species forages over open scrubby areas (Jameson and Peeters 1988; Williams 1986). Populations have disappeared from the coastal basins but appear to have stabilized elsewhere in southern California. Disturbances of roosts and loss of foraging habitat appear to be responsible for the decline (Williams 1986). A museum specimen was collected at the Santa Susana Pass (Williams 1986). The study area lies within the geographical range of the species and suitable foraging habitat is available; the species is possibly present.

Pallid Bat (*Antrozous pallidus*).

The pallid bat is a CDFG Species of Special Concern. Although the species is widespread in California its populations are declining especially in southern California. The decline is attributable to habitat destruction, roost disturbances, and use of pesticides that reduce insect populations. It is most common in open lowland areas generally below 2,000m. Insectivorous like most of the vespertilionid bats, this species feeds largely on flightless insects which it captures by foraging on the ground. Jerusalem crickets, scorpions, and June beetles are important in the diet of pallid bats. This bat may fly up to 32 miles in a single night. This species has been recorded from Placerita Canyon.

Townsend's Big-eared Bat (*Plecotus townsendii*).

This species is a CDFG Species of Special Concern. One subspecies, *P. t. townsendii*, is a USFWS Category 2 Candidate species. The federal candidate subspecies is unlikely to occur within the study area, being more characteristically found in the more humid northern and central portions of the state. However, another subspecies, *P. t. pallescens* is likely to be found in the area. It is found in a wide variety of habitats from deserts and grasslands to coniferous forests. It also has very generalized roosting requirements, and roosting sites include limestone caves, mine tunnels, buildings, and other manmade structures. The species is particularly susceptible to disturbance and is reported to abandon roosting sites after a single human visit. There is a high level of human activity throughout most if the study area which may have extirpated this species within the area.

California Mastiff Bat (*Eumops perotis californicus*).

The mastiff bat is a federal Category 2 Candidate species and a CDFG Species of Special Concern. Its range extends southward from Butte County through the southern California coastal mountains and portions of the southeastern desert region. The mastiff bat along with most other species of bats have exhibited severe population declines over the last several decades, principally because of roosting site disturbance by humans. Other factors may include loss of foraging habitat and the widespread use of pesticides which has reduced insect populations and poisoned some bats (Williams 1986; Roverud 1990). They prefer rugged, rocky areas at low elevations in the coastal basins where there are suitable crevices for roosting. The mastiff bat has very specific roosting needs. The bat requires downward opening crevices sufficiently high to allow two to three meters drop space to allow the bat to launch itself. The crevice must also be at least 5 cm wide and 30 cm deep. California mastiff bats are a migratory species that may use the site seasonally as part of their winter or summer feeding areas. These bats feed after dark or at dusk, and may fly as much as 100 miles in one night while foraging for insects (Jameson and Peeters 1988). Little is known about the size of the area used by individual bats of this species during their migratory phases. Roosting areas were not found within the study area but may occur along the periphery.

Pocketed Free-tailed Bat (*Nyctinomops femorosacca*).

The pocketed free-tailed bat is a CDFG Species of Special Concern. This bat typically roosts in rock outcrops and crevices in high cliffs (Jamesom and Peeters 1988) but will also roost in buildings. This species is limited to southern California where its population, like that of most bats, has declined due to habitat destruction, roost disturbances, and use of pesticides that reduce insect populations. This species flies late in the evening, capturing flying insects especially moths and beetles. Although not seen this species is possibly present in the study area.

★ **Black-tailed Jackrabbit** (*Lepus californicus*).

The black-tailed jackrabbit is a federal Category 2 Candidate species. The jackrabbit has declined in southern California due to attempts to control its populations as an agricultural pest. It is found in deserts, irrigated pastures, and row crops. The jackrabbit feeds on many herbs and grasses, including many cultivated crops. It is frequently active in the daytime. This species is widespread in the study area. It was recorded during SMEA surveys along the Santa Clara River floodplain, San Francisquito Canyon, Plum Canyon and Sand Canyon.

★ **Los Angeles Pocket Mouse** (*Perognathus longimembrus brevinasus*).

The Los Angeles pocket mouse is a CDFG Species of Special Concern. The decline of this species is primarily due to habitat loss as a result of conversion to agriculture, urbanization, and other human activities (Williams 1986). This species is found on fine, sandy soils. It remains underground in the cooler parts of the year for up to five months. O'Farrell (1978) reported an annual composite home range of 3,300 sq. meters for *P. longimembrus*. It feeds on the seeds of many desert plants, including grasses, goosefoot (*Chenopodium* spp.), and the desert trumpet (*Eriogonum inflatum*) (Jameson and Peeters 1988). Like all pocket mice it will also take soil-dwelling insects. *Perognathus* scat was found within the study area but no individuals were captured during trapping and as a result the specific identity of the pocket mouse species in the study area is not known. Consequently this species will still have to be considered to possibly be present.

Southern Grasshopper Mouse (*Onychomys torridus ramona*).

The southern grasshopper mouse is a federal Category 2 Candidate species. It prefers relatively xeric areas at lower elevations (Novak 1991). This species has declined primarily due to habitat loss as a result of conversion to agriculture, urbanization, and other human activities. Grasshopper mice occur at relatively low frequencies where they are found (1.83 individuals/hectare has been reported) and they have home ranges of 2-3 hectares. Although plant material is eaten at times, grasshopper mice are largely carnivorous. The diet includes grasshoppers, beetles, and a variety of other insects. *O. torridus* preys extensively on scorpions. Grasshopper mice also eat small vertebrates including such rodents as *Peromyscus*, *Perognathus*, and *Microtus* (Novak 1991). There is a questionable record of this species from Placerita Canyon, but none were caught during small mammal trapping.

American Badger (*Taxidea taxus*).

The badger is a CDFG Species of Special Concern. Badgers inhabit a variety of habitat types. General habitat requirements include friable soils, relatively open, uncultivated

grounds, and sufficient food (Williams 1986). Their food is ground-dwelling mammals, especially ground squirrels, pocket gophers, and kangaroo rats (Williams 1986; Jameson *et al* 1988). Populations throughout California have declined within the last century and populations have been extirpated from many areas of their former range (Williams 1986). The principal reasons for the decline have been loss of habitat due to urbanization and conversion to agriculture, as well as hunting and general persecution. Badgers leave a distinctive print. The home range of a badger can include from 20 acres to over 2,000 acres (Williams 1986). Although neither the animal nor its sign were seen during any of the surveys, it is probable the some individuals are occasionally present within the study area.

Summary List of Sensitive Species Located in the Study Area

The following list of sensitive species includes all the sensitive species whose presence in the study area was documented by SMEA surveys.

PLANTS

Nevin's Brickellbush (*Brickellia nevinii*)
Short-joint Beavertail Cactus (*Opuntia basilaris* var. *brachyclada*)
Peirson's Morning-glory (*Calystegia peirsonii*)
Navarretia (*Navarretia fossalis*)
California Orcutt Grass (*Orcuttia californica*)

BUTTERFLIES

San Emigdio Blue (*Plebejus emigdionis*)

FISHES

Arroyo Chub (*Gila orcutti*)
Santa Ana Sucker (*Catostomus santaanae*)
Unarmored Threespine Stickleback (*Gasterosteus aculeatus williamsoni*)

AMPHIBIANS

Western Spadefoot (*Scaphiopus hammondii*)

REPTILES

California Horned Lizard (*Phrynosoma coronatum frontale*)?
San Diego Horned Lizard (*Phrynosoma coronatum blainvillei*)?
Coastal Whiptail (*Cnemidophorus tigris multiscutatus*)
Hammond Two-striped Garter Snake (*Thamnophis hammondii hammondii*)

BIRDS

Osprey (*Pandion haliaetus*)

White-tailed Kite (*Elanus leucurus)*
Northern Harrier (*Circus cyaneus*)
Sharp-shinned Hawk (*Accipiter striatus*)
Cooper's Hawk (*Accipiter cooperi*)
Golden Eagle (*Aquila chrysaetos*)
California Gull (*Larus californicus*)
Willow Flycatcher (*Epidonax traillii*)
Horned Lark (*Eremophila alpestris actia*)
Loggerhead Shrike (*Lanius ludovicianus*)
Yellow Warbler (*Dendroica petechia*)
Sage Sparrow (*Amphispiza belli belli*)
Tricolored Blackbird (*Agelaius tricolor*)

MAMMALS

Black-tailed Jackrabbit (*Lepus californicus*)
Los Angeles Pocket Mouse (*Perognathus longimembrus brevinasus*)?

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Curricula Vitae

Curricula vitae for SMEA personnel with primary survey or supervisory responsibility follow in alphabetical order.

Jonathan N. Baskin, Ph.D.
Curtis Clark, Ph.D.
Kimball Garrett. C. Phil.
Thomas R. Haglund, Ph.D.
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Education:

1961 - B.A., Biology, Harvard University
1965 - M.S., Marine Biological Sciences, University of Miami, Florida
1973 - Ph.D., Biology, City University of New York

Employment History:

1961-1964 - Research Assistant, Institute of Marine Science, University of Miami, Florida
1962 (Summer) - Fishery Aide, Fish and Wildlife Service, Sandy Hook Marine Laboratory, New Jersey
1964-1965 - Research Assistant, Ichthyology Department, American Museum of Natural History, New York
1967-1968 - Smithsonian Institute Museum Training Fellow, Ichthyology Department, American Museum of Natural History, New York
1965-1967, 1968-1971 - Lecturer in Biology, Queens College, City University of New York
1971 to present - Assistant, Associate and Full Professor, California State Polytechnic University Pomona.
1974 - Visiting Professor, Instituto de Zoologia Tropical, Universidad Central de Venezuela, Caracas
1990 to present -Owner, San Marino Environmental Associates

Teaching Experience:

Queens College, City University of New York
Biology
Biology for non-science majors
Field Biology of Vertebrates
Comparative Vertebrate Anatomy
Embryology

California State Polytechnic University Pomona
General Vertebrate Zoology
Comparative Vertebrate Anatomy
Introductory Marine Biology
Ichthyology
Fishery Biology
Human Anatomy
Biological Techniques
Life Science
Tropical Field Biology (in Venezuela)
Ecology of the Southwestern U. S.

Membership in Professional Societies:

American Society of Ichthyologists and Herpetologists
American Society of Zoologists
Association for Tropical Biology
Desert Fishes Council
Phi Beta Delta
Sigma Xi
Society for the Study of Evolution
Society for Systematic Zoology
Southern California Academy of Science
Western Society of Naturalists
Wildlife Society

Grants and Fellowships Awarded:

Smithsonian Institute Museum Training Fellowship for training at American Museum of Natural History, Ichthyology Department, 1967-1968

National Science Foundation Travel Grant to attend NATO Advanced Study Institute in Evolution, Istanbul, Turkey, 1969

Field Study of Fishes in Latin America, Cal Poly Kellogg Unit Foundation, International Development Fund, 1973

Systematic Studies of Fishes of the Orinoco River, Venezuela. National Science Foundation Grant No. DEB77-14439, 1977-1980 (with John G. Lundberg, Duke University, co-principle investigator)

Curation of Fishes of the Orinoco River, Venezuela. NSF Grant No. DEB-8022343, 1981-1982 (with J. G. Lundberg)

Studies on Orinoco Fishes. Cal Poly Kellogg Unit Foundation (several small grants), 1979-1982

Development of Tropical Biology Field Course, Cal Poly Kellogg Unit Foundation, 1981-1982

Microcomputer Based Laboratories in College Biology. National Science Foundation Grant No. CSI-8551679, 1985-1987.

Workshop on the Historical Biogeography of Neotropical Freshwater Fishes; June 1989; San Francisco, California. National Foundation Grant No. INT-8822735, 1989.

Publications and Presentation Abstracts:

1966 - Baskin, Jonathan N., and Ernst E. Williams. The lesser Antillean Ameiva (Sauria, Teiidae) - Re-evaluation, zoogeography and the effects of predation. Studies on the Fauna of Curacao and other Caribbean Islands, vol. XXIII, pp. 144-176, 2 plates

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1972 - Baskin, Jonathan N. The anatomy and relationships of a scale-eating catfish, Apomatoceros alleni (Trichomycteridae; Stegophilinae). Fifty-second Annual Meeting of the American Society of Ichthyologists and Herpetologists, Boston, Massachusetts. p. 30. (abstract)

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1976 - Bailey, Reeve M. and Jonathan N. Baskin. Scoloplax dicra, a minute new catfish from the Bolivan Amazon. Occasional Papers of the Museum of Zoology, University of Michigan, No. 674, pp. 1-14.

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1978 - Baskin, Jonathan N., Murry D. Dailey, Steven Murray and Earl Segal, contributing editors. Proceedings of a Symposium on Urban Harbor Environment, April 16, 1977. Southern California Ocean Studies Consortium. Technical Paper No. 1: i-viii + 95 pp.

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1979 - Lundberg, John G., Francisco Mago L. and Jonathan N. Baskin. Gymnotiform Electric Fishes from Deep Channels of the Orinoco River. (ibid) (abstract)

1980 - Baskin, Jonathan N., Thomas M. Zaret and Francisco Mago-Leccia. Feeding of reportedly parasitic catfish (Trichomycteridae and Cetopsidae) in the Rio Portuguesa Basin, Venezuela. Biotropica. Vol. 12, No. 3, pp. 182-186

1985 - Mago-Leccia, Francisco, John G. Lundberg, Jonathan N. Baskin. Systematics of the South American Fish Genus Adontosternarchus (Gymnotiformes, Apteronotidae). Los Angeles County Museum of Natural History - Contributions in Science. No. 358, pp. 1-19.

1987 - Baskin, Jonathan N., Review of Fishes: A Field and Laboratory Manual on their Structure, Identification, and Natural History in Copeia 1987, No. 3, pp. 814-6.

1988 - Baskin, Jonathan N., Interview with Leon Croizat. Rivista di Biologia. vol. 81 (4), pp. 589-611.

Research Reports:

1974 - Baskin, J. N., Survey of the unarmored threespine stickleback (Gasterosteus aculeatus williamsoni) in the upper Santa Clara River drainage. Bureau of Sport Fisheries and Wildlife contract, pp. 1-67 plus appendices 1-4.

1975 - Baskin, J. N., Biology and habitat of the unarmored threespine stickleback, Gasterosteus aculeatus williamsoni, in the upper Santa Clara River, California. California Department of Fish and Game contact, pp. 1-28 plus appendices I-II.

1976 - Baskin, J. N. and M. A. Bell. Unarmored Threespine Stickleback survey and report. U.S. Department of Agriculture, Forest Service contract, pp. 1-53.

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1992 - Haglund, T. R. and J. N. Baskin. Distribution of native fishes and trout in the West Fork of the San Gabriel River October 1991. Los Angeles County Department of Public Works contract, pp. 1-12 plus appendices A-F.

1992 - Haglund, T. R. and J. N. Baskin. Distribution of native fishes and Southwestern Pond Turtles in the upper San Gabriel River Drainage. Los Angeles County Department of Public Works contract, pp.1-63 plus appendix 1.

1992 - Haglund, T. R. and J. N. Baskin. Temperature Monitoring of the West Fork of the San Gabriel River. Los Angeles County Department of Public Works contract, pp.1-16 plus appendices A-B.

1992 - Haglund, T. R., C. Clark and J. N. Baskin. Biological assessment of Haskell Creek, Los Angeles, California. James M. Montgomery Consulting Engineers contract, pp. 1-26 plus appendices 1-4.

1992 - Baskin, J. N. and T. R. Haglund. Report of fish survey of Santa Clara River stream crossings. Newhall Land and Farming Company contract, pp.1-2 plus appendices 1-2.

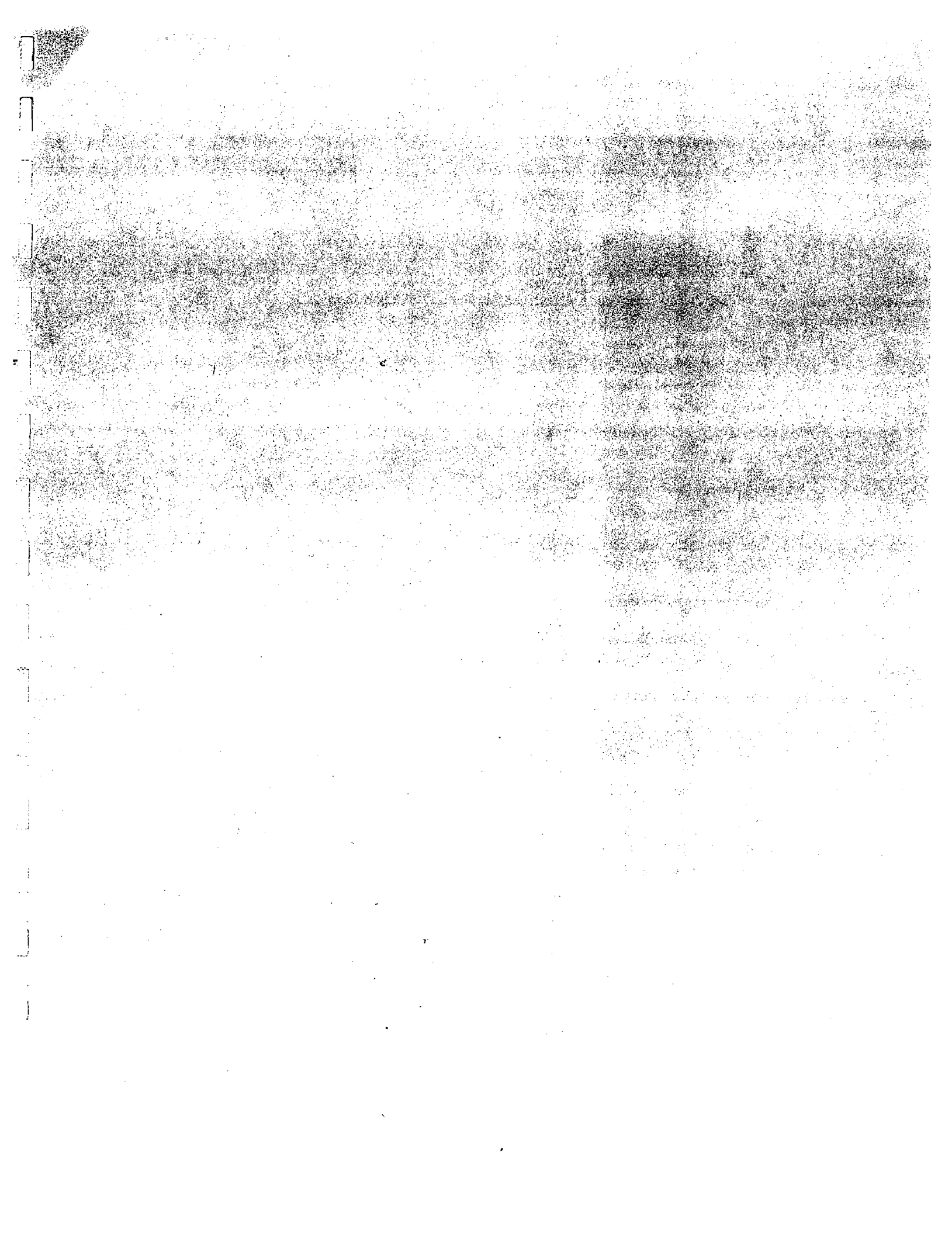
in progress

Baskin, J. N., T. R. Haglund and J. Malcolm. Monitoring, habitat improvement and transplantation of endangered Gasterosteus aculeatus populations in Southern California. California Department of Fish and Game contract.

Baskin, J. N. and T. R. Haglund. Sensitive Aquatic Species Report for the Westside Conveyance Study, Los Angeles and Ventura County. Metropolitan Water District of Southern California contract.

Other Significant Professional Activities:

Research Associate, Natural History Museum of Los Angeles County.
Board of Governors, Ocean Studies Institute, CSU.
Member, Unarmored Threespine Stickleback Recovery Team.
Founder and Owner, San Marino Environmental Associates.
Member, Significant Ecological Area Technical Advisory Committee of Los Angeles County Regional Planning Dept.
Completed American Fisheries Society Expert Witness course.



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POSITIONS HELD

Professor, Biological Sciences Department, California State Polytechnic University, Pomona. Sep 1988-present.

Associate Professor, Biological Sciences Department, California State Polytechnic University, Pomona. Sep 1984-Sep 1988.

Assistant Professor, Biological Sciences Department, California State Polytechnic University, Pomona. Sep 1980-Sep 1984.

Lecturer, Department of Botany, University of California, Davis. Jan-Jun 1980.

Staff Research Associate, Department of Ecology and Evolutionary Biology, University of California, Irvine. Jun-Sep 1979.

Lecturer, Department of Botany, University of California, Davis. Apr-Jun 1979.

Graduate Teaching Assistant, Department of Botany, University of California, Davis. Oct 1978-Mar 1979; Oct-Dec 1977; Jan-Jun 1977.

Graduate Teaching Assistant, University of Oklahoma Biological Station. May-Jul 1973; May-Jul 1974.

Graduate Teaching Assistant, Department of Botany and Microbiology, University of Oklahoma. Sep 1972-May 1973.

EDUCATION

Ph.D., University of California, Davis, March 1979; major, botany; major professor, Donald W. Kyhos.

M.S., University of Oklahoma, July 1974; major, botany; major professor, James R. Estes.

B.S., High Honors, University of Oklahoma; May 1972; major, zoology; minors, botany, chemistry, German.

HONORARY SOCIETIES

Sigma Xi (Full, 1979; Associate, 1973), Phi Sigma (1973), Phi Beta Kappa (1972), Omicron Delta Kappa (1972); Phi Eta Sigma (1970).

AWARDS

California State Polytechnic University Meritorious Performance and Professional Promise Award, 1985, 1986, 1987, 1988, 1989.
Best Paper, California Botanical Society Graduate Student Meetings, 1976.
University of Oklahoma Honors Award, 1971.

SCHOLARSHIPS AND FELLOWSHIPS

University of California Regents Fellowship, 1977-78, 1976-77.
NSF Graduate Fellowship, 1973-76.
University of Oklahoma Merit Scholarship, 1969.
National Merit Scholarship, 1969.

UNIVERSITY SERVICE

California State Polytechnic University, Pomona
Departmental Scheduling Coordinator, 1988-present.
Coordinator, Quantitative Biology Laboratory, 1987-present.
Darkroom Coordinator, 1985-present.
Member, departmental Graduate Affairs Committee, 1981-present.
Curator, Biological Sciences Herbarium (CSPU), 1980-present.
Botany Section Coordinator, 1985-1986, 1989-1990.
Member, departmental Budget Committee, 1985-1986, 1989-1990.
Chair, departmental Honors Program Committee, 1985-1988.
Member, departmental Computer Committee, 1983-1986.
Secretary, Institute for Cellular and Molecular Biology, 1982-83.
Seminar Co-Coordinator, Biological Sciences Department, 1981-82.
Faculty Sponsor, Botany Club, 1980-82.
Member, University Instructional Services Committee, 1980-81.

University of California, Davis
Vice-President, Botany Graduate Student Association, 1976-77.

University of Oklahoma
President, Omega Chapter of Phi Sigma, 1973-74.
President (1971-72), Vice-President (1970-71), University of Oklahoma Zoological Society.

PROFESSIONAL ACTIVITIES

Manuscript reviews for *Systematic Botany*, *American Journal of Botany*, *Madroño*, *Southwestern Naturalist*, *Botanical Gazette*, *Aliso*, *Australian Journal of Botany*.

Grant reviews for National Science Foundation, National Geographic Society, Southern California Botanists.

Board of Directors, Southern California Botanists, Inc., Jan 1981 - Nov 1984, Jan 1989 - Jan 1990.

President, Southern California Botanists, Inc., Jan 1990 - present.

Memberships
American Association for the Advancement of Science, American Society of Plant Taxonomists, Botanical Society of America, California Botanical Society, California Native Plant Society, International Association for Plant Taxonomy, Sigma Xi (active), Society for Systematic Zoology, Society for the Study of Evolution, Southern California Botanists, Willi Hennig Society.

PUBLICATIONS

1. Clark, Curtis. 1975. Ecogeographic races of *Lesquerella engelmannii* (Cruciferae): Distribution, chromosome numbers, and taxonomy. Brittonia 27:263-278.

2. Clark, Curtis. 1978. Pollen shed as tetrads by plants of *Eschscholzia californica* (Papaveraceae). Madroño 25:59-60.

3. Clark, Curtis. 1978. Systematic studies of *Eschscholzia* (Papaveraceae). I. The origin and affinities of *E. mexicana*. Syst. Bot. 3:374-385.

4. Clark, Curtis and Judith A. Jernstedt. 1978. Systematic studies of *Eschscholzia* (Papaveraceae). II. Seed coat microsculpturing. Syst. Bot. 3:386-402.

5. Jernstedt, Judith A. and Curtis Clark. 1979. Stomata on the fruits and seeds of *Eschscholzia* (Papaveraceae). Amer. J. Bot. 66:586-590.

6. Clark, Curtis. 1979. Ultraviolet absorption by flowers of the Eschscholzioideae (Papaveraceae). Madroño 26:22-25.

7. Clark, Curtis and Donald W. Kyhos. 1980. Specific status for *Encelia californica* var. *asperifolia* (Compositae: Heliantheae). Madroño 27:48.

8. Clark, Curtis and Grady L. Webster. 1980. Noteworthy collections: *Eschscholzia californica* Chamisso ssp. *mexicana* (Greene) C. Clark (Papaveraceae). Madroño 27:180.

9. Kyhos, D.W., Curtis Clark, and Wm. C. Thompson. 1981. The hybrid nature of *Encelia laciniata* (Compositae: Heliantheae) and control of population composition by post-dispersal selection. Syst. Bot. 6:399-411.

10. Clark, Curtis, Nancy C. Clark, Donald L. Sanders, and Emilia Parra. 1984. Noteworthy collections: *Androstephium breviflorum* S. Wats. (Amaryllidaceae). Madroño 31:192.

11. Budzikiewicz, Herbert, Gabriela Laufenberg, Curtis Clark, and Peter Proksch. 1984. New benzofuran derivatives from *Enceliopsis argophylla*. Phytochemistry 23:2625-2627.

12. Clark, Curtis and Donald L. Sanders. 1985. Lectotypification of *Enceliopsis covillei* (A. Nelson) S.F. Blake (Asteraceae: Heliantheae) and a consideration of its correct name. Taxon 34:147-149.

13. Clark, Curtis, Donald L. Sanders, and Nancy Charest. 1986. A field-oriented technique for producing high-quality preparations of plant surfaces for scanning electron microscopy. Taxon 35:295-297.

14. Clark, Curtis. 1986. Homoplastic-an appropriate choice. Syst. Zool. 35:142-143.

15. Clark, Curtis and Donald L. Sanders. 1986. Floral ultraviolet in the *Encelia* alliance (Asteraceae: Heliantheae). Madroño 33:130-135.

16. Clark, Curtis and Nancy Charest. 1986. Noteworthy collections: *Sanguisorba minor* Scop. subsp. *muricata* Briquet (Rosaceae). Madroño 33:231.

17. Clark, Curtis. 1986. *Eschscholzia lemmonii* ssp. *kernensis*: a new combination for the Tejon poppy. Madroño 33:224-225.

18. Clark, Curtis and Daniel J. Curran. 1986. Outgroup analysis, homoplasy, and global parsimony: A response to Maddison, Donoghue, and Maddison. Syst. Zool. 35:150-154.

19. Proksch, Peter and Curtis Clark. 1986. Systematic implications of chromenes and benzofurans from *Encelia* (Asteraceae). Phytochemistry 26:171-174.

20. Sanders, Donald L. and Curtis Clark. 1987. Comparative morphology of the capitulum of *Enceliopsis*. Amer. J. Bot. 74:1072-1086.

21. Ehleringer, James R. and Curtis Clark. 1987. Evolution and adaptation in *Encelia* (Asteraceae). Pp. 221-248 *in* Plant evolutionary biology. L.D. Gottlieb and S.K. Jain, eds. Chapman & Hall, London.

22. Clark, Curtis, Donald W. Kyhos, and Nancy Charest. 1988. A new *Encelia* (Asteraceae: Heliantheae) from Baja California. Madroño 35:10-15.

23. Proksch, Peter, Ursula Politt, Eckhard Wollenweber, Victor Wray, and Curtis Clark. 1988. Epicuticular flavonoids from *Encelia*. Planta Medica 1988:483-584.

24. Harrington, Daniel F., and Curtis Clark. 1989. Reduction in light reflectance of leaves of *Encelia densifolia* (Asteraceae) by trichome wetting. Madroño 36:180-186.

25. Isman, Murray B., Peter Proksch, and Curtis Clark. 1990. Terpenoid anit-herbivore chemistry of *Encelia* species (Asteraceae). *Biochemistry of the Mevalonic Acid Pathway to Terpenoids*, ch. 7, pp. 249-264. Plenum Press, New York.

26. Clark, Curtis. 1990. Peripatric speciation and the origin of crop plants. Occas. Paper #5, Archaeol. Res. Facility, Calif. St. Univ., Fullerton.

27. Clark, Curtis. 1990. Vascular plants of the undeveloped areas of California State Polytechnic University, Pomona. Crossosoma 16(4):1-7.

28. Clark, Curtis, and Mark Faull. 1991. A new subspecies and a new combination in *Eschscholzia minutiflora* (Papaveraceae). Madroño 38:(in press).

PUBLISHED ABSTRACTS

1. Clark, Curtis, Karen W. Bowers, Phillip Hall, and W. Ethen Perkins. 1973. Fluorescence patterns in selected genera of yellow-rayed Oklahoma composites. Swanews 1973 (1&2):10 (April).

2. Clark, Curtis. 1974. Correlations between the distribution of *Lesquerella ovalifolia* (Cruciferae) and geological formations in southern Oklahoma. Swanews 1974 (1&2):11 (April).

3. Clark, Curtis. 1975. Ecogeographic races of *Lesquerella engelmannii* (Cruciferae). Botanical Society of America, Abstracts.

4. Clark, Curtis. 1978. Evolution of the desert species of *Eschscholzia* (Papaveraceae). Botanical Society of America, Misc. Ser., Publ. 156.

5. Jernstedt, J.A., and Curtis Clark. 1978. Stomata on the seed coats of *Eschscholzia* (Papaveraceae). Botanical Society of America, Misc. Ser., Publ. 156.

6. Clark, Curtis, and D.W. Kyhos. 1979. Origin of species by hybridization in *Encelia* (Compositae: Heliantheae). Botanical Society of America, Misc. Ser., Publ. 157.

7. Clark, Curtis. 1980. *Eschscholzia* (Papaveraceae): An evolutionary conspectus. Pacific Division AAAS, 61st Annual Meeting, Abstracts.

8. Clark, Curtis, Wm. C. Thompson, and Donald W. Kyhos. 1980. Comparative morphology of the leaf trichomes of *Encelia* (Compositae: Heliantheae). Botanical Society of America, Misc. Ser., Publ. 158.

9. Clark, Curtis, Donald W. Kyhos, and Wm. C. Thompson. 1980. Evidence for the origin of diploid species in *Encelia* (Compositae: Heliantheae) by hybridization. Second International Congress of Systematic and Evolutionary Biology, Abstracts.

10. Clark, Curtis. 1982. Applications of block clustering in ecology and systematics. Pacific Division AAAS, 63rd Annual Meeting, Abstracts.

11. Clark, Curtis. 1982. Hybridization in *Encelia* (Compositae: Heliantheae) and its effect on phylogenetic analysis. Botanical Society of America, Misc. Ser., Publ. 162.

12. Clark, Curtis. 1982. Relationships between experimental and phylogenetic systematics: An overview. Botanical Society of America, Misc. Ser., Publ. 162.

13. Clark, Curtis. 1983. Systematics and biogeography of the *Encelia frutescens* alliance (Asteraceae: Heliantheae). Amer. J. Bot. 70(5), Part 2, p. 109.

14. Clark, Curtis. 1983. Herbarium label-writing on a "main-frame" computer. Amer. J. Bot. 70(5), Part 2, p. 102.

15. Clark, Curtis. 1984. Selection against hybrid recombinants as an isolating mechanism: the syngameon reassessed. Amer. J. Bot. 71(5), Part 2, p. 161.

16. Clark, Nancy Charest, and Curtis Clark. 1984. Comparison of trichomes of the capitulum to leaf trichomes of the *Encelia californica* clade (Asteraceae: Heliantheae). Amer. J. Bot. 71(5), Part 2, p. 152.

17. Sanders, Donald L., and Curtis Clark. 1984. Comparative morphology of the disk florets of *Enceliopsis* (Asteraceae: Heliantheae). Amer. J. Bot. 71(5), Part 2, p. 153.

18. Proksch, Peter, and Curtis Clark. 1984. New chromenes and benzofurans from the *Encelia* alliance (Asteraceae: Heliantheae) and their systematic significance. Amer. J. Bot. 71(5), Part 2, p. 183.

19. Clark, Curtis. 1986. The phylogeny of *Encelia* (Asteraceae: Heliantheae). Amer. J. Bot. 73:757.

20. Clark, Curtis. 1988. A phylogenetic view of climatic tolerance in the *Encelia* alliance (Asteraceae: Heliantheae). Amer. J. Bot. 75(6), Part 2, p. 165.

21. Nishida, Joy H., and Curtis Clark. 1988. Scanning electron microscopic study of the trichomes of *Geraea* (Asteraceae: Heliantheae). Amer. J. Bot. 75(6), Part 2, pp. 196-197.

22. Clark, Curtis, and Mark Faull. 1989. Reevaluation of the *Eschscholzia minutiflora* autopolyploid complex (Papaveraceae). Amer. J. Bot. 76(6), Supplement, p. 232.

PRESENTED PAPERS AND POSTERS

1. Clark, Curtis. 1972. A comparison of the calls of two populations of pikas (*Ochotona princeps*). Southwestern Association of Naturalists, Annual Meeting.

2. Clark, Curtis. 1972. Notes on the pollination ecology of two Oklahoma thistles. Oklahoma Academy of Sciences, 61st Annual Meeting.

3. Clark, Curtis, Karen W. Bowers, Phillip Hall, and W. Ethen Perkins. 1973. Fluorescence patterns in selected genera of yellow-rayed Oklahoma composites. Southwestern Association of Naturalists, Annual Meeting.

4. Clark, Curtis. 1973. Pollen predation in *Lolium perenne* var. *italicum* and *Sorghum halepense*. Oklahoma Academy of Science, 62nd Annual Meeting.

5. Perkins, Mary C., and Curtis Clark. 1973. Notes on the floral biology of *Indigofera miniata*. Oklahoma Academy of Science, 62nd Annual Meeting (presented by Curtis Clark).

6. Clark, Curtis. 1974. Correlations between the distribution of *Lesquerella ovalifolia* (Cruciferae) and geological formations in southern Oklahoma. Southwestern Association of Naturalists, Annual Meeting.

7. Clark, Curtis. 1975. Ecogeographic races of *Lesquerella engelmannii* (Cruciferae). American Society of Plant Taxonomists, Annual Meeting.

8. Clark, Curtis. 1975. Ultraviolet reflection and fluorescence of flowers: Applications and techniques. California Botanical Society, Graduate Student Meetings.

9. Clark, Curtis. 1976. The identity of *Eschscholzia mexicana* (Papaveraceae): A preliminary report. California Botanical Society, Graduate Student Meetings (award for best paper).

10. Clark, Curtis. 1977. Evolution of the desert species of *Eschscholzia* (Papaveraceae). California Botanical Society, Graduate Student Meetings.

11. Clark, Curtis. 1978. Evolution of the desert species of *Eschscholzia* (Papaveraceae). American Society of Plant Taxonomists, Annual Meeting.

12. Clark, Curtis, and D.W. Kyhos. 1978. *Encelia* X *laciniata* (*E. ventorum* X *E. palmeri*): interspecific hybridization in Baja California. California Botanical Society, Graduate Student Meetings.

13. Clark, Curtis, and D.W. Kyhos. 1979. Origin of species by hybridization in *Encelia* (Compositae: Heliantheae). American Society of Plant Taxonomists, Annual Meeting.

14. Clark, Curtis. 1980. *Eschscholzia* (Papaveraceae): An evolutionary conspectus. Pacific Division AAAS, 61st Annual Meeting.

15. Clark, Curtis, Wm. C. Thompson, and Donald W. Kyhos. 1980. Comparative morphology of the leaf trichomes of *Encelia* (Compositae: Heliantheae). Botanical Society of America, Annual Meeting (poster).

16. Clark, Curtis, Donald W. Kyhos, and Wm. C. Thompson. 1980. Evidence for the origin of diploid species in *Encelia* (Compositae: Heliantheae) by hybridization. Second International Congress of Systematic and Evolutionary Biology.

17. Clark, Curtis. 1982. Applications of block clustering in ecology and systematics. Pacific Division AAAS, 63rd Annual Meeting.

18. Clark, Curtis. 1982. Hybridization in *Encelia* (Compositae: Heliantheae) and its effect on phylogenetic analysis. American Society of Plant Taxonomists, Annual Meeting.

19. Clark, Curtis. 1982. Relationships between experimental and phylogenetic systematics: An overview. American Society of Plant Taxonomists, Annual Meeting.

20. Clark, Curtis, and Nancy C. Clark. 1983. Use of trichome morphology in studies of the phylogeny of *Encelia* (Asteraceae). Institute for Cellular and Molecular Biology (California State Polytechnic University, Pomona), Fellows Symposium.

21. Clark, Curtis. 1983. Systematics and biogeography of the *Encelia frutescens* alliance (Asteraceae: Heliantheae). American Society of Plant Taxonomists, Annual Meeting.

22. Clark, Curtis. 1983. Herbarium label-writing on a "main-frame" computer. Botanical Society of America, Annual Meeting (poster).

23. Clark, Curtis. 1983. Label-writing on mainframe computers. Herbarium Curators Meeting, October 14, Missouri Botanical Garden.

24. Clark, Curtis. 1984. Selection against hybrid recombinants as an isolating mechanism: the syngameon reassessed. American Society of Plant Taxonomists, Annual Meeting.

25. Proksch, Peter, and Curtis Clark. 1984. New chromenes and benzofurans from the *Encelia* alliance (Asteraceae: Heliantheae) and their systematic significance. American Society of Plant Taxonomists, Annual Meeting (presented by Curtis Clark).

26. Clark, Curtis. 1986. The phylogeny of *Encelia* (Asteraceae: Heliantheae). American Society of Plant Taxonomists, Annual Meeting.

27. Clark, Curtis. 1988. A phylogenetic view of climatic tolerance in the *Encelia* alliance (Asteraceae: Heliantheae). American Society of Plant Taxonomists, Annual Meeting.

28. Clark, Curtis, Jonathan N. Baskin, and Jaime A. Tres. 1988. Linear measurement in biology: Comparison of computer-assisted with manual techniques. American Institute of Biological Sciences, Annual Meeting.

29. Clark, Curtis. 1989. Preparation of herbarium labels in lower division flora courses. Association of Biologists for Computing, Winter 1989 Meeting.

30. Clark, Curtis. 1989. A free word-processing program for computer application classes. Association of Biologists for Computing, Winter 1989 Meeting.

31. Clark, Curtis, and Mark Faull. 1989. Reevaluation of the *Eschscholzia minutiflora* autopolyploid complex (Papaveraceae). American Society of Plant Taxonomists, Annual Meeting.

EDUCATIONAL PUBLICATIONS

1. Clark, Curtis. 1981. Why do scientific names have those curious abbreviations after them? Crossosoma 7(3):10.

2. Clark, Curtis. 1982. What is a "type specimen"? Crossosoma 8(4):4-6.

3. Clark, Curtis. 1983. Uses of computers in plant taxonomy. Crossosoma 9(1):24-25.

4. Clark, Curtis. 1983. Everything you wanted to know about writing for *Crossosoma*, but were afraid to ask. Crossosoma 9(3):1-2.

5. Clark, Curtis. 1984. Looking at plant names. Crossosoma 10(4):7-8.

COMPUTER SOFTWARE

1. Clark, Curtis. 1988. Corn (Version 1.0): A program demonstrating the classic dyhibrid cross in corn endosperm. Freeware, distributed by the author and by the Association of Biologists for Computing lending library.

2. Clark, Curtis, and Jaime Tres. 1988. Maiz (Version 1.0): Identical to "Corn", *pero en español*. Freeware, distributed by the author and by the Association of Biologists for Computing lending library.

3. Clark, Curtis. 1989. Scheda (version 1.3): A program for preparing herbarium specimen labels. Freeware, distributed by the author and by the Association of Biologists for Computing lending library.

RESEARCH GRANTS AND CONTRACTS

1970 NSF Grant-in-Aid (University of Oklahoma Biological Station): Behavioral studies of the cotton rat (*Sigmodon hispidus*). ($250)

1972 Oklahoma Biological Survey Research Grant: Collections of *Lesquerella* (Cruciferae) in Oklahoma. ($150)

1976 Sigma Xi Grant-in-Aid of Research: Experimental systematic studies of *Eschscholzia* (Papaveraceae). ($200)

1977 NSF Doctoral Dissertation Research Grant DEB 77-02234: Experimental systematic studies of *Eschscholzia* (Papaveraceae). ($1750)

1980 Affirmative Action Faculty Development Grant: Scanning electron microscopic studies of *Encelia* (Compositae). ($635, 4 Weighted Teaching Units)

1980 Institute for Cellular and Molecular Biology Research Grant: S*p+3Xtudy of the glandular leaf trichomes of *Encelia* (Compositae). ($800)

1981 Cal Poly Kellogg Unit Foundation Educational Grant: Field studies of *Encelia* (Compositae). ($175)

1983 Cal Poly Kellogg Unit Foundation Educational Grant: Purchase of climatic database computer tape. ($300)

1983 California Department of Parks and Recreation: Contract for study of the factors influencing flowering of *Eschscholzia californica* at the Antelope Valley California Poppy Reserve. ($5000)

1983 Cal Poly Kellogg Unit Foundation Seed Grant: Systematic studies of *Encelia* (Asteraceae) and related genera. ($300)

1983 Affirmative Action Faculty Development Grant: Systematic studies of *Encelia* (Asteraceae) and related genera. ($395)

1985 Cal Poly Kellogg Unit Foundation Seed Grant: Systematic studies of *Helianthella* (Asteraceae). ($600)

1985 NSF College Science Instrumentation Program grant: Microcomputer-based laboratories in college biology (coauthor and associate director; P.D.: J.N. Baskin). ($45,419)

1986 Cal Poly LandLab Research Grant: Phylogenetic engineering of brittlebush (*Encelia* spp.) for revegetation and slope stabilization. ($3100)

1986 Cal Poly LandLab Research Grant: Responses of the biota of the Cal Poly campus to a sanitary landfill and other urban land uses (P.D.: R.J. Quinn). ($38,000)

1987 Cal Poly LandLab Research Grant: Phylogenetic engineering of brittlebush (*Encelia* spp.) for revegetation and slope stabilization. (second-year renewal, $2462)

1987 Cal Poly LandLab Research Grant: Responses of the biota of the Cal Poly campus to a sanitary landfill and other urban land uses (P.D.: R.J. Quinn). (second-year renewal, ca. $38,000)

1987 Cal Poly Kellogg Unit Foundation Special Funding Project: Instrumentation Program Grant (P.D., S.H. Bryant). ($3800)

1988 Non-Formula-Based Instructional Equipment Lottery Matching Funds: Microcomputer-Based Laboratories (P.D., S.H. Bryant). ($47,550)

1988 Cal Poly Kellogg Unit Foundation Educational Grant: Camera Attachment for Scanning Electron Microscope. ($1800)

1988 Cal Poly LandLab Research Grant: Responses of the biota of the Cal Poly campus to a sanitary landfill and other urban land uses (P.D.: R.J. Quinn). (third-year renewal, $25,254)

1988 Cal Poly LandLab Research Grant: Phylogenetic engineering of brittlebush (*Encelia* spp.) for revegetation and slope stabilization. (third-year renewal, $1772)

1989 Cal Poly LandLab Research Grant: Phylogenetic engineering of brittlebush (*Encelia* spp.) for revegetation and slope stabilization. (fourth-year renewal, no additional funding)

INVITED SEMINARS

1980 November. Plants of Baja California. Cal Poly Pomona (Field Botany Club).

1981 November. Chemical constituents of *Encelia* trichomes. Cal Poly Pomona (ICMB lunch seminar).

1982 June. Plant morphogenesis: biology of nyctinasty. Cal Poly Pomona (ICMB Journal Club).

1983 March. Hybridization in *Encelia* (Compositae: Heliantheae) and its effect on phylogenetic analysis. Cal Poly Pomona (Biological Sciences Faculty Research Seminar).

1983 April. Using CYBER word-processing programs. Cal Poly Pomona (Biolunch seminar).

1984 January 19. Hybridization in *Encelia* (Asteraceae: Heliantheae) and its effect on phylogenetic analysis. University of California, Davis (Botany 222 speaker).

1984 March 12. Selection against hybrid recombinants as a reproductive isolating mechanism: the syngameon reassessed. San Diego State University (departmental seminar).

1985 February 8. Cladistics for real: The systematics of *Encelia* (Asteraceae: Heliantheae). Rancho Santa Ana Botanical Garden (weekly seminar series).

1985 November 16. Peripatric speciation and the origin of crop plants. Seventh Symposium of Man, Department of Anthropology, California State University, Fullerton.

1987 May 1. Techniques for preparing projection slides for scientific presentations. Rancho Santa Ana Botanical Garden.

1988 November 17. Phylogenetic engineering of brittlebush for revegetation and slope stabilization. California State Polytechnic University, Pomona (Spadra Showcase - research and development projects involving Spadra landfill).

1990 November 13. Endangered species: Will there be a tommorrow? Panel discussion at California State Polytechnic University, Pomona.

Tateman Foundation Cruise
Biologist-Diver, 1980
Baseline Biologic Survey of the Marine Resources of Santa Rosa and San Miguel Islands, California

Surgery Research Laboratory, Sepulveda Veterans Administration Hospital
Biochemical Technician, 1980-1981
Role of Cholesterol in the Formation of Gall Stones (used mass spectrometer and biochemical assays)

Department of Biology, University of California, Los Angeles
Postdoctoral Scholar (with D.G. Buth), 1985-1990
Biology of the Gasterosteidae, with emphasis on their biochemical systematics

Department of Biology, University of California, Los Angeles
Project Supervisor (with D.G. Buth), 1990-present
Population structure and allozyme variation in native populations of the federally endangered Razorback Sucker (Xyrauchen texanus)

Department of Biology, University of California, Los Angeles
Research Biologist, 1990-present
Population genetics and systematics of freshwater fishes

ENVIRONMENTAL RESEARCH:

1979. U.S. Army Corps of Engineers Contract, DACW09-79-M-1584
Biological Assessment of Lower Sespe Creek, Ventura Co., CA

1980. U.S. Army Corps of Engineers Contract, DACW09-80-M-1566
Biological Assessment of Santa Paula Creek, Ventura Co., CA

1981. Graduate Assistant, Water Quality Unit, California State Department of Water Resources, Southern Branch

1988. Environmental Consultant, Valencia Corporation
Status of the Federally Endangered Unarmored Threespine Stickleback in Castaic Creek and lower San Francisquito Canyon

1989. Environmental Consultant, Impact Sciences
Status of fishes in the creeks above Lake Piru

1990. Fisheries Consultant, Los Angeles Department of Water and Power
Status of introduced Threespine Sticklebacks in the Mono Lake Basin and status of the Owens Lake Pupfish

1991. Environmental Consultant, San Marino Environmental Associates, Metropolitan Water District
Impacts of the proposed Westside Conveyance System on fishes, amphibians and reptiles of the Santa Clara River

1991. Fisheries Consultant, San Marino Environmental Associates, California Department of Fish and Game
Impacts of the Mobil Oil spill on the fisheries resources of the Santa Clara River

1991. Environmental Consultant, San Marino Environmental Associates, Los Angeles County Department of Public Works
Distribution of native fishes in the San Gabriel River and Impacts of the phase 1 dewatering of Cogswell Reservoir on the native fish and turtle populations

1991. Environmental Consultant, San Marino Environmental Associates, Los Angeles County Department of Public Works
Population studies on "wild" trout and native fishes in the West Fork of the San Gabriel River and Temperature monitoring on the West Fork of the San Gabriel River

1992. Environmental Consultant, San Marino Environmental Associates, Newhall Land and Farming Company
Fish survey for road crossings of the Santa Clara River

1992. Environmental Consultant, San Marino Environmental Associates, Dames and Moore
Sensitive aquatic species survey of alternative pipeline corridors

1992. Environmental Consultant, San Marino Environmental Associates, James Montgomery Consulting Engineers
Biological assessment of Haskell Creek following a sodium hydroxide spill

1992. Fisheries Consultant, San Marino Environmental Associates, Los Angeles County Department of Public Works
Population estimates of native fishes in the West Fork of the San Gabriel River

1992. Fisheries Consultant, San Marino Environmental Associates, EA Engineering, Science and Technology
Habitat suitability curves for native southern California freshwater fish species

1993. Environmental Consultant, San Marino Environmental Associates, Sanitation Districts of Los Angeles County
Status of least Bell's vireo

1993. Environmental Consultant, San Marino Environmental Associates, Southern California Gas Company
Status of least Bell's vireo

GRANTS:

UCLA Regents Research and Travel Grant, 780000-07427-5, funded June, 1976, ($750)
Biogeography of the Strombus (Strombus) group

National Science Foundation Grant, DEB-7725292, funded January, 1978, ($37,000)
Stratigraphic variation and evolutionary mechanisms of fossil threespine sticklebacks (Gasterosteus doryssus) within the Pliocene middle Truckee Formation, Nevada

California Department of Fish and Game, funded June, 1986, ($6,000)
Electrophoretic analyses of southern California sticklebacks (Gasterosteus aculeatus)

California Department of Fish and Game, funded February, 1987, ($21,000)
Electrophoretic and morphologic analyses of southern California sticklebacks (Gasterosteus aculeatus) with emphasis on unplated populations (G. a. williamsoni)

California Department of Fish and Game, funded July, 1990, ($17,000)
Reintroduction of endangered stickleback populations and monitoring of the introduced populations - Establishment of transplant criteria

California Department of Fish and Game, funded May, 1991, ($18,678)
Systematic relationships of the Santa Ana Speckled Dace, Rhinichthys osculus

California Department of Fish and Game, funded August, 1992, ($15,537.50)
Genetics of the Klamath Basin suckers

California Department of Fish and Game, funded April, 1993, ($3,368)
Electrophoretic studies of endangered southern California sticklebacks

RECENT PRESENTATIONS:

Congress of European Ichthyologists; August, 1985; Stockholm, Sweden
The relationship between lateral plate phenotype and aggression in breeding male threespine sticklebacks

Southern California Academy of Sciences; May, 1987; Los Angeles,California
Allozyme variation and the recognition of the "white" stickleback, Gasterosteus sp.

Southern California Academy of Sciences; May, 1988; Northridge, California
Southern California unarmored sticklebacks and the electrophoretic identification of Gasterosteus aculeatus williamsoni

American Society of Ichthyologists and Herpetologists; June, 1988; Ann Arbor, Michigan
Allozymes of southern California unarmored threespine stickleback populations

Congress of European Ichthyologists; August, 1988; Budapest, Hungary
Allozyme comparisons of North American, European and Asian populations of the nine-spined stickleback, Pungitius pungitius

Desert Fishes Council; November, 1988; Death Valley, California
Status of populations of threespine sticklebacks, Gasterosteus aculeatus, at the southernmost portion of their Pacific coast range
and
Native freshwater and anadromous fishes of coastal southern California

American Society of Ichthyologists and Herpetologists; June, 1989; San Francisco, California; Symposium: Historical Biogeography of North American Fishes

Allozyme comparisons of North American, European and Asian populations of the nine-spined stickleback, Pungitius pungitius.

Desert Fishes Council; November, 1989; Albuquerque, New Mexico

Population structure in Catostomus plebeius: Are there two or three species in this complex?

Southern California Academy of Sciences; May, 1990; Los Angeles, California

Systematics of Catostomus plebeius

American Society of Ichthyologists and Herpetologists; June, 1990; Charleston, South Carolina

Allozyme comparisons of North American, European and Asian populations of the threespine stickleback, Gasterosteus aculeatus

Southern California Academy of Sciences; May, 1991; Los Angeles, California

The status of the native freshwater fishes of coastal southern California

American Society of Ichthyologist and Herpetologists; June, 1991; New York, New York

Genetic integrity of the transplanted San Felipe Creek population of the federally endangered Unarmored Threespine Stickleback
and
Phylogenetic systematics of the cyprinid genera Mylopharodon and Ptychocheilus: allozyme comparisons

Desert Fishes Council; November, 1991; Death Valley, California

Gene expression and hybridization in the federally endangered Cui-ui, Chasmistes cujus

American Fisheries Society; February, 1992; Redding, California - Invited Speaker

Management of the native fishes of the Los Angeles basin

Desert Fishes Council; November, 1992; Mesa, Arizona

Gene expression in the razorback sucker, Xyrauchen texanus

PUBLICATIONS:

Haglund, T.R. 1977. New occurrences and paleoecology of Peronedon primus Olson (Keraterpetontidae, Nectridea). Jour. Paleontol. 51:982-985.

Bell, M.A. and T.R. Haglund. 1978. Selective predation by garter snakes on the threespine stickleback (Gasterosteus aculeatus). Evolution 32:304-319.

Johanson, S., S. Werner and T.R. Haglund. 1981. Water quality in the Paso Robles area. Memorandum Report, California State Department of Water Resources, Southern District, vii+116p.

Haglund, T.R. 1981. Differential reproduction among the lateral plate phenotypes of the threespine stickleback (Gasterosteus aculeatus). Ph.D. dissertation, Univ. California, Los Angeles, xi+117p.

Bell, M.A. and T.R. Haglund. 1982. Fine-scale temporal variation of the Miocene stickleback, Gasterosteus doryssus. Paleobiology 8:282-292.

Matson, R.H., C.B. Crabtree and T.R. Haglund. 1986. Ichthyofaunal composition and recolonization in a central California tidepool. Cal. Fish and Game Bull. 72:227-231.

Haglund, T.R. and D.G. Buth. 1988. Allozymes of the unarmored threespine stickleback (Gasterosteus aculeatus williamsoni) and identification of the Shay Creek population. Isozyme Bull. 21:196.

Haglund, T.R., D.G. Buth and R. Lawson. 1989. Allozyme comparisons of North American, European and Asian populations of the nine-spined stickleback, Pungitius pungitius. Isozyme Bull. 22:65-66.

Swift, C.C., T.R. Haglund and M. Ruiz. 1990. Status of freshwater fishes of southern California with recommendations for preserves to maintain their existence. Unpubl. Report, California Dept. of Fish and Game, 206p.+figures.

Haglund, T.R., D.G. Buth and D.M. Blouw. 1990. Allozyme variation and the recognition of the "white" stickleback (Gasterosteiformes: Gasterosteidae, Gasterosteus). Biochem. Syst. Ecol. 18:559-563.

Haglund, T.R. and D.G. Buth. 1991. Status of populations of threespine sticklebacks, Gasterosteus aculeatus, at the southernmost portion of their Pacific coastal range. Proc. Desert Fish Council 20:73.

Swift, C.C. and T.R. Haglund. 1991. Native freshwater and anadromous fishes of coastal southern California. Proc. Desert Fish. Council 20:53.

Haglund, T.R. 1991. Allozyme differences, duplicate gene expression and "hybridization" between the federally endangered Cui-ui (Chasmistes cujus) and the Tahoe Sucker (Catostomus tahoensis). Isozyme Bull. 24:49.

Haglund, T.R. 1991. Molecular Systematics - Book Review. Isozyme Bull. 24:16-17.

Haglund, T.R., D.G. Buth and R. Lawson. 1992. Allozyme variation and phylogenetic relationships of Asian, North American and European populations of the threespine stickleback, Gasterosteus aculeatus. Copeia 1992: 432-443.

Buth, D.G., T.R. Haglund and W.L. Minckley. 1992. Duplicate gene expression and allozyme divergence diagnostic for Catostomus tahoensis and the endangered Chasmistes cujus in Pyramid Lake, Nevada. Copeia 1992:935-941.

Haglund, T.R., D.G. Buth and R. Lawson. 1992. Allozyme variation and phylogenetic relationships of Asian, North American, and European populations of the ninespine stickleback, Pungitius pungitius, pp. 438-452. In: Systematics, Historical Ecology and North American Freshwater Fishes. R. Mayden (ed.) Stanford University Press. 969 p.

Swift, C.C., T.R. Haglund, M. Ruiz and R.N. Fisher. 1993. The status and distribution of the freshwater fishes of southern California. Bull. S. Cal. Acad. Sci. 92:101-167.

Buth, D.G. and T.R. Haglund. 1994. Allozyme variation in the Gasterosteus aculeatus complex, pp. 61-84. In: The Evolutionary Biology of the Threespine Stickleback. M.A. Bell and S.A. Fisher (eds). Oxford University Press.

Haglund, T.R. 1994. Electrophoretic and Isoelectric Focusing Techniques in Fisheries Management - Book Review. Isozyme Bull. 27:37.

Buth, D.G., T.R. Haglund and S.L. Drill. 1994. Resolution of creatine kinase in catostomid fishes: starch makes a difference. Isozyme Bull. 27:61.

Haglund, T.R., D.G. Buth and V. Cassano. 1994. Utility of "non-lethal" tissues in the study of the federally endangered razorback sucker Xyrauchen texanus. Isozyme Bull. 27:63.

Haglund, T.R. Manuscript. Differential levels of aggression among lateral plate phenotypes of reproductive male sticklebacks (Gasterosteus aculeatus).

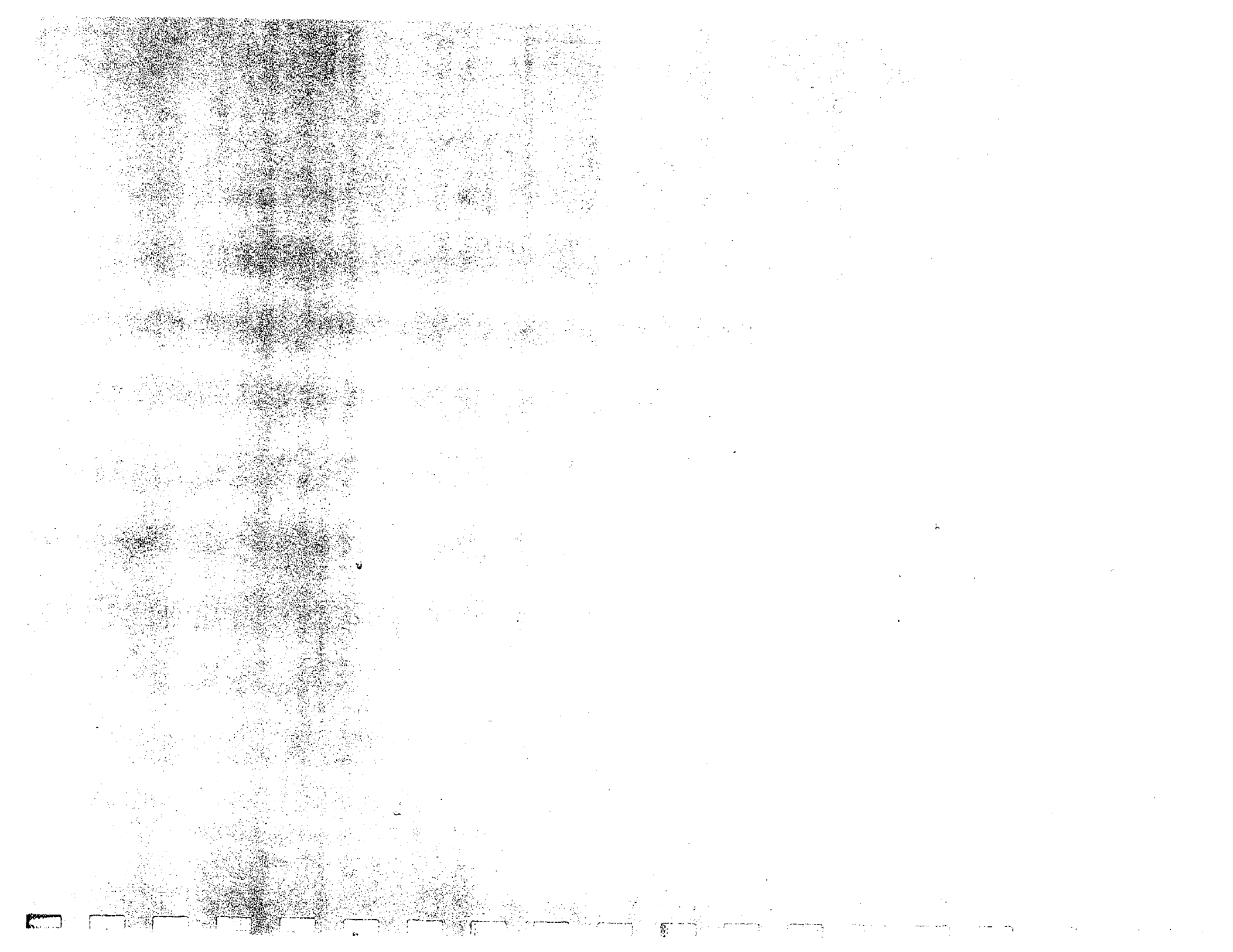
Haglund, T.R., L. Wright and C.B. Crabtree. Manuscript. Status of the threespine stickleback (Gasterosteus aculeatus) in Baja California del Norte, Mexico.

Haglund, T.R. and D.G. Buth. In Prep. Duplication of the mitochondrial isocitrate dehydrogenase locus in male threespine sticklebacks, (Gasterosteus aculeatus).

Buth, D.G., T.R. Haglund and D.H. Moon. In Prep. Population structure in Catostomus plebius: Are there two or three species in this complex?

Buth, D.G., T.R. Haglund and S. Drill. In Prep. Population structure in the federally endangered Razorback sucker, Xyrauchen texanus.

Buth, D.G., T.R. Haglund and V. Cassano. In prep. Gene expression in the Razorback sucker, Xyrauchen texanus.



Resume

Rudolf H. T. Mattoni
9620 Heather Road
Beverly Hills, CA 90210
(310) 264 1052, 275 3290

Education

University of California, Berkeley, 1950 B.S. Entomology
University of California, Los Angeles, 1953, M.A. Zoology, Genetics, Ecology
University of California, Los Angeles, 1957, PhD. Zoology, Genetics, Ecology

Military Service

U. S. Army medical corps, 1945-1947

Public Service

1984-1986	President, Royce 270, support group for the UCLA Center for the Performing Arts
1984-	Board of Directors, Long Beach Opera
1983-1985	Board of Directors, Los Angeles Chamber Orchestra

Professional Affiliations

1947	Consultant in Entomology, AEC
1947-1956	President/Founder. Bio Metal Associates (now Bioquip Products)
1950-1952	Teaching Assistant, UCLA (Zoology)
1952-1955	Research assistant in Botany, UCLA
1956-1960	Assistant research botanist, UCLA
1960-1962	Instructor/assistant professor, CSU L.A. and Northridge
1961-1962	Senior research scientist. Spacelabs, Inc. Van Nuys
1962-1966	Consultant / Project engineer, North American Aviation, S&ID, Downey, CA
1964-1969	Principal investigator, NASA Biosatellite program
1966-1969	Manager / Founder, Biological Systems Division, NUS Corp. Hawthorne, CA
1969-1973	President / Founder, International Microbiological Products, Inc. Hawthorne, CA
1969-1980	President / Founder, Agri Science Laboratories, Inc. Los Angeles
1977-1980	Board of Directors, Consulting Chemists Association
1977-	President / Founder, Agresearch, Inc. Beverly Hills, CA
1977-	Editor, Journal of Research on the Lepidoptera
1979-	President, Lepidoptera Research Foundation, Inc. Beverly Hills, CA
1983-1986	Board of directors, Institute for Conservation Biology, Palo Alto, CA
1992-	Los Angeles County Environmental Review Board

Professional Experience

AEC. Responsible for the field survey to assay the effects of the first atomic explosion on native insect populations, Socorro, NM.

Biology-UCLA. Research on the genetics of natural populations of the wild fruit fly Drosophila pseudoobscura. Work included cytogenetic determination of chromosome variation, lethal frequencies, lethal allelism and mutation rates. Synthesized special marker systems for the study of crossing over and interchromosomal interactions on recombination.

Population structure of the butterfly Philotes sonorensis. Variation of phenotypes with respect to their micro-distribution and movement.

CSU LA and Northridge. Undergraduate teaching: Introductory Biology, upper division Genetics, survey course in Genetics and Evolution. Developed all courses although textbooks had been selected by others.

Spacelabs, Inc. Background studies on personal sanitation and hygiene in the enclosed habitats of astronauts. Theoretical work on the micro-ecology of long duration space flight including development of cleanliness procedures.

North American Aviation, Inc. Directed research programs on the genetics and population dynamics of microorganisms of significance to recycling within closed ecological systems. Study included analysis of evolutionary processes in steady state algae populations over long time periods (USAF contract). Project director of a study to determine the kinetics of algal and bacterial populations on the biochemistry of waste water treatment in large scale demonstration biological solar reaction vessels (USPHS - AWTP contract on Industrial Photosynthesis). Investigation of the effects of the space environment, especially hypogravity and radiation, on fundamental genetic processes in lysogenic bacteria (NASA biosatellite program).

NUS Corp. Continued studies of genetics of lysogenic bacteria under irradiation in space. Successfully completed the biosatellite program with two experiments flown in space orbit (NASA). Developed a program to isolate and identify anti-tumor and neurotoxic drugs of natural organisms. Investigated development of economic means to separate microbial biomasses produced by large scale biological solar reactors.

International Microbiological Products. Developed new methods to produce mushroom spawn as starter cultures for commercial mushroom culture. Co-discovered mushroom viruses in California. Investigated practical methods of controlling and automating composting processes.

Agri Science Laboratories, Inc. Directed analytic chemistry, biochemistry, and microbiological testing in agricultural products, foods, medical devices, environment and soils. Personally standardized protocols for over 600 standard assays including laboratory quality control. Qualified the laboratory as AOCS referees. Established the first use of a microcomputer for laboratory management in a non-medical laboratory. Developed advanced testing methods using gas, liquid and thin layer chromatography for toxic residues. In addition to over 100 regular commercial clients, performed contract work for the USDA-APHIS, FDA, USDAS-ARS, USAF, and city and county agencies. First California laboratory to be certified in chemistry, microbiology, and bioassay testing of water (1975).

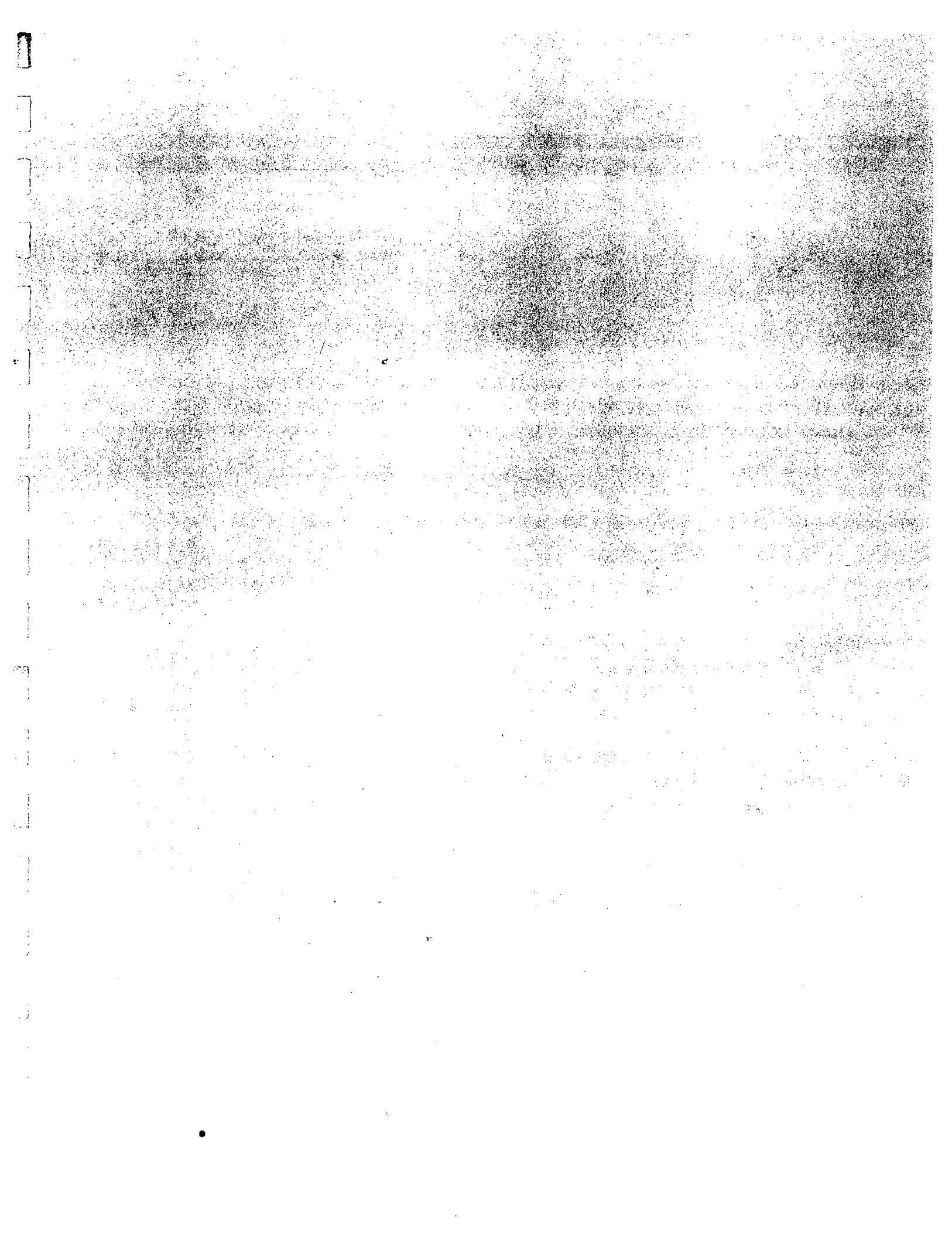
Agresearch, Inc. The company was established in Arizona to produce three million cotton pink bollworm moths per day. These were sterilized for control of the bollworm in the San Joaquin Valley, 1977-1983 (USDA-APHIS). Developed synthesis methods for insect pheromones (boll weevil) and mass production of insect virus for biological control (USDA-APHIS). Mass reared Heliothis moths for bioassay. Performed research and development on mass culture for growing specialty gourmet food mushrooms: shiitake, wood ear, pom-pom, oyster, and enoki species.

Directed the biological survey of the El Segundo sand dunes fragment at the west end of LAX. Developed and currently implementing the plan to restore the severely damaged ecosystem of the coastal sand dunes and adjacent habitats (200 acres), action necessary to preserve a federally listed endangered species and ten additional sand dune endemic species discovered during the survey. The work includes establishment of a nursery for mass native plant propagation, design of a low cost irrigation system, managing a corps of volunteers, etc. The program is continuing. The restoration phase is expected to last for six years with a permanent management.

Designed and obtained permits for the Playa Vista sand dune restoration segment of the Ballona Wetlands project. Designed, obtained permits, and implemented a re-vegetation project on the Ballona lagoon. Provide nursery stock for the California Department of Parks and Recreation.

Personal interest in the systematics and ecology of lycaenid butterflies has continued since graduate school. Systematic work included description of two new genera, a new species, and seven subspecies. Established methods to mass rear Lepidoptera on artificial diets for captive breeding of the federally listed endangered California butterfly species (California department of Fish and Game contract).

Author of 45 papers and over 120 reports, currently editing a series of field guides for the greater Los Angeles area in addition to the Journal of Research on the Lepidoptera, the leading international professional journal in its field. The first field guide, dealing with butterflies, has just been published. The second on reptiles and amphibians is nearing completion. Several others are in preparation.



CURRICULUM VITAE OF GLENN R. STEWART
Revised June 5, 1991

DEGREES:

B.S. in Biological Sciences, Cal Poly, San Luis Obispo, 1958

M.A. in Zoology, Oregon State University, Corvallis, 1960

Ph.D. in Zoology (emphasis in Ecology and Natural History), O.S.U., 1963
Dissertation: Thermal Ecology of the Garter Snakes Thamnophis sirtalis concinnus (Hallowell) and Thamnophis ordinoides (Baird and Girard)

EMPLOYMENT:

Biological Sciences Department, Cal Poly, Pomona, 1963 to present; currently Professor of Zoology.

Zoologist, National Audubon Society, Summer, 1966.

Coordinator of Zoology Section, Biological Sciences Department; 1974-76.

Faculty Supervisor of Biological Sciences Animal Facilities, 1965 to present.

Current teaching assignments include: Vertebrate Zoology, Mammalogy, Herpetology, Wildlife Ecology, Environmental Conservation, Special Projects, Senior Seminars and Graduate Seminars.

PUBLICATIONS:

Stewart, G.R. and A.I. Roest, 1960. Distribution and habits of kangaroo rats at Morro Bay. Journal of Mammalogy 41(1):126-129.

Stewart, G.R., 1965. Thermal ecology of the garter snakes Thamnophis sirtalis concinnus (Hallowell) and Thamnophis ordinoides (Baird and Girard). Herpetologica, 21(2):81-102.

Stewart, G.R., 1968. Some observations on the natural history of two Oregon garter snakes (genus Thamnophis). Journal of Herpetology, 2(3-4): 71-86.

Stewart, G.R., 1969. A western yellow bat in Los Angeles County, California. Bulletin of the Southern California Academy of Sciences, 68(3): 194-195.

Stewart, G.R., 1971. Rare, endangered and depleted amphibians and reptiles in California. Herpetology 5(2):29-35.

Stewart, G.R., 1972. An unusual record of sperm storage in a female garter snake (genus Thamnophis). Herpetologica 28(4):346-347.

Stewart, G.R., and R.S. Daniel, 1972. Scales of the lizard Gekko gecko: Surface structure examined with the scanning electron microscope. Copeia 1972 (2):252-257.

Bury, R.B. and G.R. Stewart, 1973. California protects its herpetofauna. HISS News-Journal 1(2):43-47.

St. Amant, J.A., F.G. Hoover, and G.R. Stewart, 1973. African clawed frog, Xenopus laevis laevis (Daudin), established in California. California Fish and Game 59(2):151-153.

Stewart, G.R., and R.S. Daniel, 1973. Scanning electron microscopy of scales from different body regions of three lizard species. Journal of Morphology 139(4):377-388.

Stewart, G.R., and R.S. Daniel, 1975. Microornamentation of lizard scales: some variations and taxonomic correlations. Herpetologica 31(1):117-130.

Stewart, G.R., 1976. The Utah population of the desert tortoise, Gopherus agassizi, is endangered! Page 122. In: N.J. Engberg, S. Allan and R.L. Young, eds, Desert Tortoise Council, Proceedings of 1976 Symposium, Long Beach, California.

Stewart, G.R., 1977. Charina, Charina bottae, Rubber Boa. Catalogue of North American Amphibians and Reptiles, Society for the Study of Amphibians and Reptiles, pp. 205.1-205.2.

Bellemin, J.M. and G.R. Stewart, 1977. Color convergence and diagnostic characters in the garter snakes Thamnophis elegans terrestris and T. couchi atratus along the central California coast. Bulletin of the Southern California Academy of Sciences 76(2):73-84.

Cook, J.C., A.E. Weber and G.R. Stewart. 1978. Survival of captive tortoises released in California. pp. 130-133. In: M. Trotter and C.G. Jackson, eds, Desert Tortoise Council, Proceedings of 1978 Symposium, Long Beach, California.

Weber, A.E., J.C. Cook, and G.R. Stewart. 1979. A second report on survival in rehabilitated desert tortoises. pp. 101-103. In: E. St. Amant, ed. Desert Tortoise Council, Proceedings of 1979 Symposium, Long Beach, California.

Stewart, G.R., J.M. Siperek, and V.R. Wheeler. 1980. Use of the cataleptoid anesthetic CI-744 for chemical restraint of black bears. pp. 57-61. In: C.J. Martinka and K.L. McArthur, eds. Bears-Their Biology and Management. Bear Biology Association Conference Series No. 3.

Novick, J.H., J.M. Siperek, and G.R. Stewart. 1981. Denning ecology of the black bear (Ursus americanus) in southern California. Calif. Fish and Game 67:52-61.

Fusari, M., S.M. Juarez, G.R. Stewart, and J. Edell, 1981. Summary of a report for the California Department of Transportation and results of a brief survey of desert tortoises occurring along I-15 south of Barstow, California. pp. 54-57. In: K.A. Hashagen, ed. Desert Tortoise Council, Proceedings of 1981 Symposium, Long Beach, California.

Novick, H.J. and G.R. Stewart, 1982. Home range and habitat preferences of black bears in the San Bernardino Mountains of southern California. Calif. Fish and Game 68:21-35.

Rossman, D.A. and G.R. Stewart. 1987. Taxonomic reevaluation of Thamnophis couchii (Serpentes: Colubridae). Occas. Papers Mus. Zool., Louisiana State Univ. (63): 1-25.

Quinn, R., P.A. Stanton, and G. Stewart. 1988. Vertebrates: California. pp: 176-179. In: R.L. Specht, ed., P.C. Catling, Co-ordinator. Mediterranean-type Ecosystems: A Data Source Book. Kluwer Academic Publishers, Dordrecht, The Netherlands.

Stewart, G.R. 1988. The rubber boa (Charina bottae) in California, with particular reference to the southern subspecies, C.b. umbratica. pp. 131-138. In: H.F. De Lisle, et al., eds. Proceedings of the California Conference on Herpetology, Southwestern Herpetologists' Society, Special Publication No. 4, Van Nuys, California.

Burge, B.L., G.R. Stewart, J.E. Roberson, K. Kirtland, R.J. Baxter, and D.C. Pearson. 1989. Excavation of winter burrows and relocation of desert tortoises (Gopherus agassizii) at the Twentynine Palms Marine Corps Air Ground Combat Center. pp. 32-39. In: M. Trotter, ed. Desert Tortoise Council, Proceedings of 1985 Symposium, Long Beach, California.

Baxter, R.J. and G.R. Stewart. 1990. Excavation of winter burrows and relocation of desert tortoises (Gopherus agassizii) at the LUZ solar generation station Kramer Junction, California. pp. 124-127. In: D. Daniels, ed. Desert Tortoise Council, Proceedings of 1986 Symposium, Long Beach, California.

Baxter, R.J. and G.R. Stewart. 1990. Report of continuing field work on the desert tortoise (Gopherus agassizii) at the Twentynine Palms Marine Corps Air Ground Combat Center, Spring 1985. pp. 128-140. In: D. Daniels, ed. Desert Tortoise Council, Proceedings of 1986 Symposium, Long Beach, California.

CURRENT RESEARCH:

Ecology and systematics of Pacific Coast garter snakes
Ecology and systematics of the rubber boa
Biology of the black bear in southern California
Ecology of the desert tortoise

GENERAL INTERESTS:

Biogeography of western amphibians, reptiles and mammals
Status of threatened species

GRANTS AND CONTRACTS:

1. Relocation and Survival of Desert Tortoises at Kramer Junction (LUZ Engineering Corp.) 1987-89 $77,629

2. Home Range and Movements of Mountain Lions on Camp Pendleton Marine Corps Base (U.S. Navy) 1987-89 $20,000

3. Southern Rubber Boa Survey, Snow Summit Ski Area, San Bernardino Mountains (Snow Summit Ski Corp.) 1987-89 $10,000

4. Distribution Survey and Status Report on the Southern Rubber Boa (U.S. Fish and Wildlife Service) 1989-91 $2,500

5. Desert Tortoise and Mojave Ground Squirrel Survey, Edwards Air Force Base (U.S. Air Force) 1987 $1,500

6. Monitoring Rodent Populations and Movements of Coyotes, Raccoons and Opossums on the Cal Poly Campus and Spadra Landfill (Cal poly Kellogg Foundation) 1986-89 $20,144

7. Home Range, Habitat Preferences, and Denning Behavior of the Black Bear in the Angeles National Forest (Los Angeles County Fish & Game Commission) 1985-89 $13,265

8. Excavation and Relocation of Desert Tortoises at Kramer Junction Solar Energy Generating Plant (LUZ Engineering Corp.) 1985-86 $3,250

9. Distribution and Census of Desert Tortoise on 29 Palms Marine Corps Base (U.S. Navy) 1984-87 $40,000

10. Herpetofauna Survey of the Imperial Valley to La Rosita 230 kV Transmission Line Corridor (California Public Utilities Commission, contracted through Environmental Science Associates, Inc.) 1983 $500

11. Focused E.I.R. for Orchard Creek Rubber Boa Habitat (San Bernardino County Environmental Planning Dept.) 1981 $400

12. Herpetological Survey and Impact Assessment for White Water Dams (U.S. Corps of Army Engineers, contracted through Environmental Science Associates, Inc.) 1980 $2,800

13. Herpetological Evaluation of Santa Catalina Island, (Center for Natural Areas) 1980 $500

14. Feasibility of a Highway Crossing System for Desert Tortoises (Cal Trans) 1978-1981 $9,952

15. Status of the Rubber Boa in the Angeles National Forest (U.S. Forest Service) 1976 $2,700

16. Biology of the Black Bear in the San Bernardino Mountains (San Bernardino and Riverside County Fish and Game Commissions and Cal Poly Foundation) 1975-1980 $13,600

17. Genetics of Color Pattern and Scutellation in California Garter Snakes (Sigma Xi) 1969 $300

CONSULTING:

1. Threatened and Endangered Species of Amphibians and Reptiles (California Department of Fish and Game)
2. Prohibited Species of Amphibians and Reptiles (California Department of Fish and Game)
3. Southern Rubber Boa Advisory Committee (Chairman)
4. Bighorn Research Institute (Advisor)
5. Ad Hoc Desert Tortoise Studies Review Group for California Low Level Radioactive Waste Disposal Project - California Department of Health

PROFESSIONAL SOCIETIES:

Sigma Xi (Full Member, a Past President of Cal Poly Club)
American Society of Ichthyologists and Herpetologists (Member, Environmental Quality Committee, 1970-75; 1980-Present)
Herpetologist's League (Chairman, Conservation Committee, 1972-74)
Southern California Academy of Sciences (Member, Conservation Committee, 1972-74)
American Society of Mammalogists
American Institute of Biological Sciences
American Association for Advancement of Science
Western Society of Naturalists
Society for the Study of Amphibians and Reptiles (Chairman, SSAR-HL Joint Conservation Committee, 1975-76)

Curriculum Vitae

KIMBALL LEWIS GARRETT
Born: 5 January 1953
Inglewood, California, USA

Collection Manager
Section of Vertebrates
Natural History Museum of Los Angeles County
900 Exposition Blvd.
Los Angeles, CA 90007

Home Address:
2829 Henrietta Ave.
La Crescenta, CA 91214

Phone: (213) 744-3368 (office)
(818) 249-1742 (home)
FAX: (213) 746-2999

Education

A.B. 1974 University of California, Berkeley (Zoology); Undergraduate at University of California, Los Angeles, 1970-1973.

Ph.D. Candidate University of California, Los Angeles (advanced to candidacy in Biology, January 1977)

Grants received while a graduate student

Frank M. Chapman Memorial Fund, American Museum of Natural History, 1976

Professional affiliations

American Ornithologists' Union - Member since 1974; Elective Member, 1987; Life Member, 1988)
Cooper Ornithological Society - Member since 1974
Wilson Ornithological Society - Member since 1977
Western Field Ornithologists - Member since 1970; member Board of Directors, 1992-present
National Audubon Society, Los Angeles Chapter - Member since 1966
Association of Field Ornithologists - Member since 1982
Society for the Preservation of Natural History Collections - Member since 1986

Public service

1977-1980 First Vice-President, Los Angeles Audubon Society
1976-1977 Second Vice-President, Los Angeles Audubon Society
1986-- Scientific Advisor, Los Angeles Audubon Society
1983-1986 Member, Science Working Group, Santa Monica Mountains National Recreation Area
1993-- Member, Arroyo Seco Habitat Advisory Committee, City of Pasadena

Teaching experience

1975-1979 Teaching Assistant, Teaching Associate and Teaching Fellow, Department of Biology, UCLA.

Courses in general biology, biology of vertebrates, ornithology, mammalogy and ecology.

1976-1989 Instructor, University of California at Los Angeles Extension Program. Courses in ornithology and natural history conducted in California, Baja California and Arizona.

1981-1986 Instructor, National Park Service, Santa Monica Mountains National Recreation Area Field Seminar Program (including public programs and docent training programs)

1975-1976 Instructor, Los Angeles Audubon Society. Courses in beginning field ornithology.

1986-- Instructor, Natural History Museum of Los Angeles County (courses and lectures in ornithology, birding).

Employment

1982-- Collection Manager, Section of Vertebrates, Natural History Museum of Los Angeles County. I oversee the use and maintenance of the ornithological collections, numbering 108,000+ specimens. Duties include specimen collection, preparation and cataloguing; processing of loans and specimen data requests; handling of public inquiries; curation and conservation of existing collections; and assistance with public programs and exhibits. Since 1992 I also have responsibility for overseeing collection management of the terrestrial mammal collection, which numbers over 90,000 specimens.

1982 Curatorial Assistant, Western Foundation of Vertebrate Zoology, Los Angeles, California.

Biological Consulting Experience

1979-1982 Research Biologist, Athene Wildlife Associates (later, Ecosystems, Inc.), Topanga, California.

1977-1982 Biological Consultant, Dames and Moore Environmental Associates, Los Angeles, California.

1975-1976 Biological Consultant, Geomega Planning Services, Van Nuys, California.

1981-1982 Participant in field team conducting regular censuses of the Bolsa Chica marshes, Orange Co., California, for Signal-Landmark Properties.

1981 Field biologist for a study conducted through the Santa Barbara Museum of Natural History on the behavior of seabirds in the vicinity of oil slicks in the Santa Barbara Channel, California.

1993-4 Contracted by San Marino Environmental Associates to conduct an assessment of the avifauna of the Santa Clarita area.

Professional Activities

1971-1994 Conducted standardized Breeding Bird Surveys

for the U. S. Fish and Wildlife Service in Los Angeles and San Bernardino Counties, California

1975-1986 Conducted research on the geographical ecology of the White-headed Woodpecker (Picoides albolarvatus); field studies were conducted primarily in the Transverse Ranges of southern California and writing is in progress. In 1978 I received a Frank M. Chapman Fund grant from the American Museum of Natural History to be used toward this study.

1975-1984; 1990 Compiler, Malibu Christmas Bird Count, an annual census sponsored by the National Audubon Society.

1975-1976 Participant in a raptor survey of the Angeles National Forest, jointly sponsored by the United States Forest Service, the Western Foundation of Vertebrate Zoology and the Audubon Society.

1976-1981 Conducted research with Jon L. Dunn on the status and distribution of the birds of southern California for a book commissioned by the Los Angeles Audubon Society. The project was completed and published in 1981.

1978-1994 Member, California Bird Records Committee of the Western Field Ornithologists (including service on the California Check-List Sub-Committee and Introduced Bird Species Sub-Committee).

1979-1994 Los Angeles County Coordinator for the Southern Pacific Coast Region of American Birds, published by the National Audubon Society.

1979-1981 Conducted a two-winter study entitled "The effects of human activity on wintering Bald Eagles in the Big Bear Valley, California", for the San Bernardino National Forest, United States Forest Service. For this study I was retained as a Research Assistant in the Department of Geography, UCLA, under Dr. Hartmut Walter.

1982-1994 Referee of manuscripts for The Auk, Condor, The Murrelet, Terra, Southwestern Naturalist, Western Birds, Collection Forum, The Chat, The 'Elepaio, Bulletin of the Southern California Academy of Sciences, Journal of Field Ornithology, Trans. West. Sect. Wildlife Soc.

1984-1994 Member of the Editorial Board of Western Birds, the journal of the Western Field Ornithologists.

1984-1988 Member, Birding Advisory Council, Bushnell, Inc. (a division of Bausch and Lomb).

1988-1994 Book Review Editor, Birding Magazine

1985-1989 Project Director, Natural History Museum of Los Angeles County's "Collections Care Pilot Training Program", treating the care and preservation of natural history collections, funded by the Bay Foundation and

administered by the National Institute for the Conservation of Cultural Property.

1986 Conducted a study of the populations and habitat requirements of the seabirds of Bikini Atoll, Marshall Islands, for the Bikini Atoll Rehabilitation Committee and the United States Department of Energy.

1986-1990 Designee of the Natural History Museum of Los Angeles County to the Council of the National Institute for the Conservation of Cultural Property.

1987-1994 Member of Committee on Collections of the American Ornithologists' Union.

1987-1994 Member of Conservation and Resources Committees of the Society for the Preservation of Natural History Collections

1990 Member, Local Committee for American Ornithologists' Union/Cooper Ornithological Society Joint Meeting, Los Angeles, June 1990

1992-1994 Initiated a project to gather data on the identity, distribution, seasonal status and ecology of feral parrots and parakeets in the Greater Los Angeles region

Field Experience

North America (extensively), Jamaica (1969), western and southern Mexico (1976, 1981, 1983), Galapagos Islands (1984), eastern tropical Pacific Ocean (1984), Marquesas Islands and Tuamotu Archipelago (1984), Kenya (1985), England (1985), Marshall Islands (1986), Kiritimati, Line Islands (1987), Johnston Atoll (1988), Chile and Antarctic Peninsula (1988), Australia and New Zealand (1990), Ecuador (1991).

Bird Banding Experience

I have assisted with the following bird banding projects (dates and names of permittees in parentheses):

Passerines, Duarte CA (1970; Jonathan L. Atwood)
" Arcadia CA (1985; Mike San Miguel)
House Sparrows, Los Angeles Co., CA (1986-7; Ralph W. Schreiber)
Seabirds, Christmas Island Warblers (1987; Ralph W. Schreiber)
Seabirds, Johnston Atoll (1988; Elizabeth Anne Schreiber)
Waterbirds, Salton Sea, CA (1991-2; Kathy C. Molina)
Passerines, Los Angeles Co., CA (1991; William L. Principe)

Specimen Preparation Experience

I have prepared about 1900 bird specimens at the Natural History Museum of Los Angeles County (as study skins, flat skins, skeletons, and spirit specimens); this includes considerable experience in field collecting and tissue sampling.

Natural History Tour-Leading Experience

California (for Los Angeles Audubon Society, California Natural History Tours, Wings Inc., Victor Emanuel Nature Tours, UCLA Extension, Natural History Museum of Los Angeles County; 1975-1993)
California (offshore; for Los Angeles Audubon Society, UCLA Extension, Shearwater Journeys, Natural History Museum of Los Angeles County; 1975-1993)
Arizona (for UCLA Extension; 1977-1982)
Texas (for Wings, Inc.; 1980)
Baja California (offshore and islands; for UCLA Extension; 1977-1980)
Mexico (Sinaloa and Nayarit; for UCLA Extension; 1981)
Kenya (for Natural History Museum of Los Angeles County; 1985)
Antarctica (for Natural History Museum of Los Angeles County; 1988)

Scientific Publications

1. Johnson, N. K. and K. L. GARRETT. 1974. Interior bird species expand breeding ranges into southern California. Western Birds 5:45-56.
2. Jones, H. L. and K. L. GARRETT. 1979. Winter bird population study: Creosote scrub, II. American Birds 33:45-46.
3. Jones, L., K. L. GARRETT and A. Small. 1981. Checklist of the birds of California. Western Birds 12:57-72.
4. Remsen, J. V., K. L. GARRETT and R. A. Erickson. 1982. Vocal copying in Lawrence's and Lesser Goldfinches. Western Birds 13:29-33.
5. GARRETT, K. L. 1987. Occurrence of the Laughing Gull (Larus atricilla) in the Marshall Islands. 'Elepaio 47:73-74.
6. Dunn, J. L. and K. L. GARRETT. 1987. The identification North American gnatcatchers. Birding 19:17-29.
7. GARRETT, K. L. and R. W. Schreiber. 1988. The birds of Bikini Atoll, Marshall Islands: May 1986. Atoll Research Bulletin, No. 314: 1-46.
8. McFarlane, Donald A. and K. L. GARRETT. 1989. The prey of Common Barn-Owls (Tyto alba) in dry limestone scrub forest of southern Jamaica. Caribbean Journal of Science 25: 21-23.
9. GARRETT, K. L. 1989. Documentation guidelines for the preparation and conservation of biological collections. Collection Forum 5:47-51.
10. GARRETT, K. L. 1990. Leucistic Black-vented Shearwaters (Puffinus opisthomelas) in southern California. Western Birds 21(2):69-72.
11. Dunn, J. L. and K. L. GARRETT. 1990 The identification of Ruddy and Common Ground-Doves.

Birding 22(3):138-145.

12. Johnston, R. F. and K. L. GARRETT. 1994. Population trends of introduced birds in western North America. Pp. 221-231 in J. R. Jehl, Jr., and N. K. Johnson, eds. A century of avifaunal change in western North America. Studies in Avian Biology, No. 15.
13. GARRETT, K. L. (in press) A white Green Heron in southern California. Western Birds.

Publications: Books

1. GARRETT, K. L. and J. L. Dunn. 1981. Birds of southern California: status and distribution. Los Angeles Audubon Society, Los Angeles. 408 pp.
2. GARRETT, K. L. in Farrand, J., Jr. 1983. The Audubon Society master guide to birding, Vol. I-III. Alfred A. Knopf, New York. [Ordinal accounts and 22 species accounts contributed].
3. GARRETT, K. L. in Mace, A., Ed. 1986. The birds around us. Ortho Books, San Francisco. [Chapter on bird diversity, classification and evolution, entitled "Changes through time"].
4. Line, L., K. L. GARRETT, and K. Kaufman. 1987. The Audubon Society book of waterbirds. Alfred A. Knopf, New York. [Six chapters on groups of waterbirds].

Selected Reviews

1. GARRETT, K. L. 1984. Birds of southern California's Deep Canyon, 1983, by W. W. Weathers. Reviewed in Western Birds 15:93-94.
2. GARRETT, K. L. and R. W. Schreiber. 1984. Seabirds: an identification guide, 1983, by P. Harrison. Reviewed in Wilson Bulletin 96:333-335.
3. GARRETT, K. L. 1987. Field guide to the birds of North America, second edition, 1987, by National Geographic Society. Reviewed in Wildbird 1:52-57.
4. GARRETT, K. L. 1988. Guidelines for managing bird collections, 1986, by P. Cato. Reviewed in Collection Forum 4(1):18-19.
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2. GARRETT, K. L. 1977. West Mexico: the tropical connection. Western Tanager 43(9):1-3.
3. GARRETT, K. L. 1979. Field notes -- for fun and profit. Western Tanager 45(8):9-10.

4. GARRETT, K. L. 1979. Hybridization -- the lump and split game renewed. Western Tanager 46(1):1-5.
5. GARRETT, K. L. 1979-1980. A closer look. Western Tanager 46(3-10). [A series of articles dealing with intraspecific variation in common California bird species]
6. GARRETT, K. L. 1980. Research in review. Western Tanager 47(1-6). [A series of articles detailing current research on birds conducted by Los Angeles area ornithologists]
7. GARRETT, K. L. and J. L. Dunn. 1981-1984. [A series of articles on difficult identification problems in North American field ornithology]. Western Tanager 48(4)-52(3).
8. Baxter, H. and K. L. GARRETT. 1983-1988. Birds of the season. Western Tanager 50(1)-51(6). [Monthly column summarizing bird sightings in southern California]
9. GARRETT, K. L. 1984. Spring in southern California: a bird's-eye view. Audubon Imprint 7(6):1-3.
10. GARRETT, K. L. 1986. Southern California's exotic birds. Terra 24(5):5-11.
11. GARRETT, K. L. 1989. Owls and owling in southern California. Terra 27(3):12-15.
12. GARRETT, K. L. 1989. The urban cowbird. Terra 28: 10-16.
13. GARRETT, K. L. 1990 A bird in the hand: the ornithological collections of the Natural History Museum of Los Angeles County. Terra 28(4):25-31.
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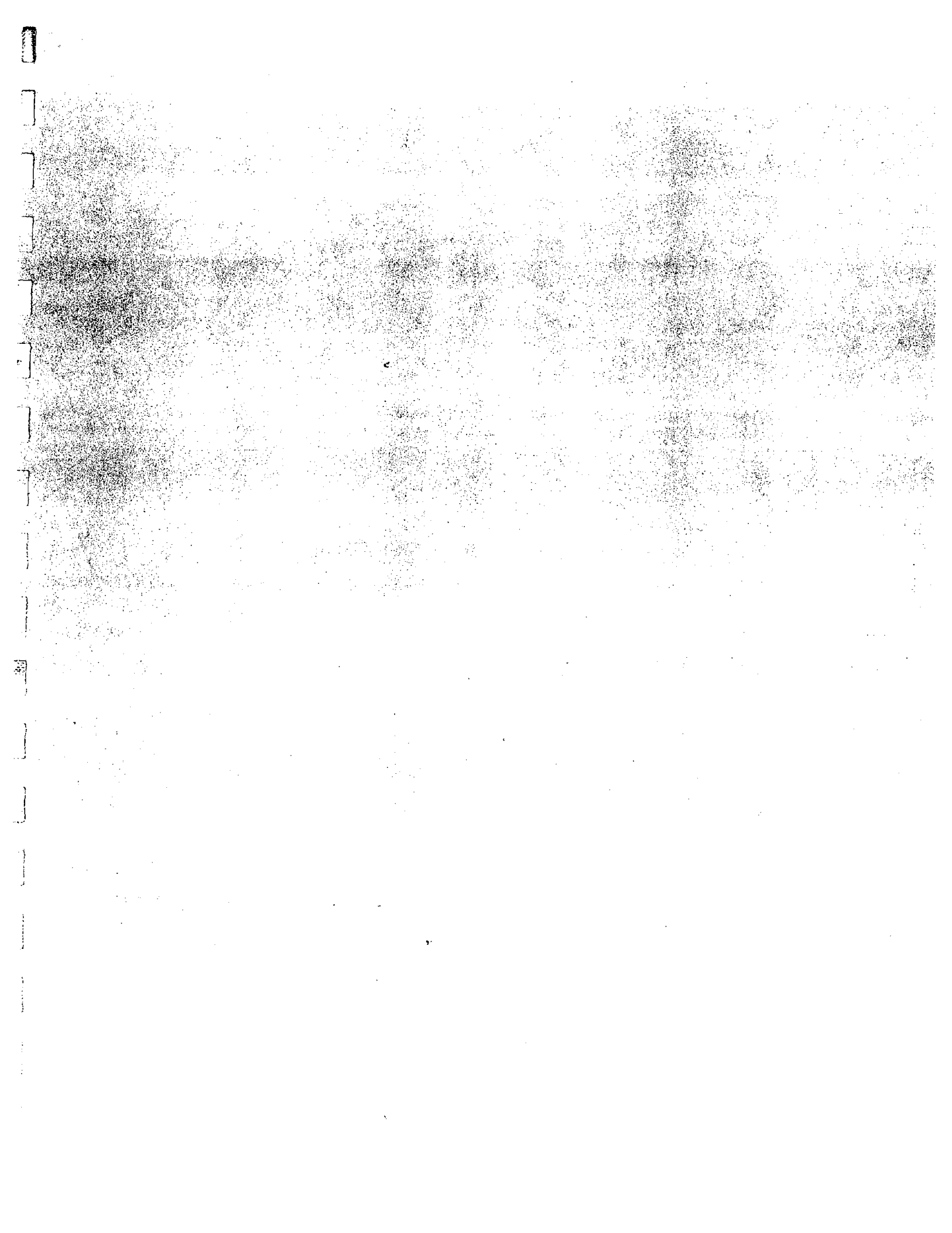
1. GARRETT, K. L. and H. Walter. 1981. The effects of human activity on wintering Bald Eagles in the Big Bear Valley, California. United States Forest Service, San Bernardino National Forest. 89pp.
2. GARRETT, K. L. and R. W. Schreiber. 1986. The birds of Bikini Atoll, Marshall Islands, May 1986. Report for the Bikini Atoll Rehabilitation Committee.

Papers presented at scientific meetings

1. GARRETT, K. L. 1982. Geographical ecology of the White-headed Woodpecker: a conifer diversity threshold. Cooper Ornithological Society, Logan, Utah.
2. GARRETT, K. L. 1982. Adaptations of woodpeckers. Western Field Ornithologists, San Diego, Calif.
3. GARRETT, K. L. 1983. Wintering strategies of birds in montane southern California: two years compared. Cooper Ornithological Society, Albuquerque, N.M.
4. GARRETT, K. L. 1985. Museum collections and the field

ornithologist: uses and abuses. Western Field Ornithologists, Palm Springs, Calif.

5. GARRETT, K. L., J. R. Malcolm and H. Walter. 1985. Wintering Bald Eagles and human activity in the Big Bear Basin, southern California. American Ornithologists' Union, Tempe, Arizona.
6. GARRETT, K. L. 1987. Preservation methodologies and suggestions for long-term storage of avian flat skins. Society for the Preservation of Natural History collections, Montreal, Canada.
7. Barkley, L. J. and K. L. GARRETT. 1987. Training in the care of natural history collections: a report on the Collections Care Pilot Training Program at the Natural History Museum of Los Angeles County. Society for the Preservation of Natural History Collections, Montreal, Canada.
8. GARRETT, K. L. and L. J. Barkley. 1988. Training in the care of natural history collections: beyond the Collections Care Pilot Training Program. Society for the Preservation of Natural History Collections, Pittsburgh, Pennsylvania.
9. GARRETT, K. L. 1989. Collection management techniques for flat skins and other non-traditional bird specimens. American Ornithologists' Union, Pittsburgh, PA.
10. GARRETT, K. L. 1990. Documentation guidelines. Society for the Preservation of Natural History Collections, Chicago, Illinois.
11. GARRETT, K. L. 1990. Current ideas in the management and preservation of specimen collections of birds. 20th International Ornithological Congress, Christchurch, New Zealand.
12. GARRETT, K. L. 1991. Procedimientos, tecnicas y materiales para la preservacion a largo plazo de colecciones ornitologicas. IV Congreso Ornitologia Neotropical, Quito, Ecuador.
13. GARRETT, K. L. 1993. A status review of feral exotic bird species in southern California. Cooper Ornithological Society, Sacramento CA.



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PRESENT POSITIONS:

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EDUCATION:

B.S. (1972). Geology, University of Washington

Ph.D. (1981). Biology, University of California, Los Angeles

EMPLOYMENT:

Teaching:

Department of Geology, University of Illinois, Chicago
Teaching Assistant, 1972-1974

Geology 2	Introduction to Geology
Geology 101	Principles of Geology 1 (Geomorphology)
Geology 102	Principles of Geology 2 (Earth's Interior)
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Department of Biology, University of California,
Los Angeles
Teaching Associate, 1975-1978
Teaching Fellow, 1979-1981

Biology 2	Principles of Biology (non-majors)
Biology 1B,4A	Introduction to Organismic Biology
Biology 4L	Introductory Biology Lab
Biology 110	Vertebrate Morphology
Biology 116	Evolution of Mammalian Dentitions
Biology 119	Introduction to Ecology and Evolution
Biology 165	Organismic Physiology
Biology 166	Animal Physiology

Department of Biology, California State University, Los Angeles
Lecturer, 1981-1982
- Biology 103 Introduction to Ecology and Evolution
- Biology 315 Genetics
- Biology 415 Ichthyology
- Biology 475 Animal Behavior
- Biology 485 Heredity and Evolution

Department of Biology, California State University, Dominguez Hills
Lecturer, 1982
- Biology 102 General Biology (non-majors)
- Biology 115 Principles of Biology Laboratory

Dental School Faculty Continuing Education Program, UCLA
Seminar Speaker, 1982
- Evolution of Mammalian Dentitions

Department of General Education, Otis-Parsons Institute
Lecturer, 1983
- LA275 Scientific Methods -- Biology

Biology Department, University of California Extension, Los Angeles
Instructor, 1976, 1981-1986
- Biology X411.3 The Fauna of Lower Sespe Creek (field course)
- Biology XL5 Introduction to Organismic Biology

Department of Biology, University of California, Los Angeles
Lecturer, 1986
- Biology 112 Ichthyology

Research:

Paleontology Section, Thomas Burke Memorial Washington State Museum
Volunteer worker, 1971-1972
- Taxonomy and Curation of Cenozoic Molluscs

Department of Biology, University of California, Los Angeles
Research Associate (to E.C. Olson), 1974-1975
- Taxonomy and Paleoecology of Permian Reptiles

U.S. Forest Service Contract
Research Assistant (to M.A. Bell), 1975
- Study of the Federally Endangered Unarmored Threespine Stickleback

Desert Tortoise Council (Founding Member, Past Co-Chairman, Member of Board of Directors, 1976-present)
Desert Fishes Council

HONORS:

Recipient of Distinguished Teacher Award at Cal Poly, Pomona, 1976.

Recipient of Distinguished Alumnus Award, Cal Poly, San Luis Obispo. 1976.

Recipient of Ralph W. Ames Award for distinction in research, School of Science, Cal Poly, Pomona, 1985.

Recipient of Desert Tortoise Council Annual Award for Outstanding Service, 1987.

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Impact Analysis for Santa Clarita Water District's Water Appropriation Application Santa Clara River, Los Angeles County, California

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